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FEBRUARY 22, 1999 ▪ VOL. 33 ▪ NO. 8 ▪ $4 /COPY

GARY LAUFMAN

CEM KANER, a Santa Clara, Calif., lawyer and user advocate, says the current draft of the legal code for software licensing is full of provisions that favor vendors

USERS CRY FOUL

SOFTWARE LICENSING

THE SOFTWARE INDUSTRY is steamrolling user interests as lawyers draft a Uniform Commercial Code revision covering the sale and use of software, according to an in-depth report by *Computerworld* senior editor Kathleen Melymuka. For example, the latest draft would make shrink-wrap and click-wrap licenses enforceable — even though buyers can't see them until after the purchase — and let vendors electronically shut off a buyer's system when there's a contract dispute. As one IT manager put it: "The process just plain stinks."

Report starts on page 52

BETA 3 FIXES TACKLE WIN 9X MIGRATION

Microsoft concedes problem is significant; vows to build upgrade path to Win 2000

BY SHARON GAUDIN

Users will face significant problems migrating from the Windows 9x desktop to Windows 2000, Microsoft Corp. officials conceded last week, adding that they're trying to fix most of the issues before the third beta release, due in April.

"The upgrade to Windows 2000 Professional from Windows 95 or Windows 98 still has too many issues, so we're spending a lot of time working on that," said Craig Beilinson, Microsoft product manager for Windows NT.

Major issues include the fact that the Windows 95 architecture and registries are "completely different" from NT's. "We heard about it in Beta 2 [from users]. I think people will see a big difference in Beta 3, and we'll continue working on it as we move toward final code," Beilinson said.

Microsoft is trying to build a migration path for users moving to Windows 2000. Beilinson said the company is taking a two-pronged approach, working on several improvements to existing utilities in Beta 2 and creating some completely new tools.

But to really ease the upgrade pain, Microsoft is working on the problem of migrating applications.

"We have to figure out a way to bring your applications forward," he said. "If I install Windows 2000, and then I install Office or Notes or Word, that should work fine. But if I'm first on 95 and I've got my apps installed and then I upgrade to Windows 2000 on top of that, we're in a different place now. The application is already installed, so it doesn't know it's running on NT and has to run

Beta 3, page 95

Uphill Climb

Potential hurdles in migrating from Windows 95 or 98 to Windows 2000:

- Different registries
- Incompatible applications
- Different architectures
- Windows 2000 needs more RAM and storage

MICROSOFT PLOTS E-COMMERCE BID

Wants to prove it can handle big Web sites

BY KIM S. NASH

Microsoft Corp. is expected to make a splashy, tie-it-all-together electronic-commerce announcement next week, orchestrated to show big corporate users that its products can handle high-traffic Web sites.

Chairman and CEO Bill Gates and President Steve Ballmer are due to speak at the event, which set off speculation that Microsoft would use it to announce a much-rumored company reorganization [CW, Feb. 15]. Microsoft's

Microsoft, page 16

HEADS UP: 'FIXED' Y2K CODE HAS FLAWS

Review shows one error in every 2,000 lines

BY THOMAS HOFFMAN

Organizations spending tens or hundreds of millions of dollars to make their systems year 2000-ready are likely to end up with a software portfolio that still has some flaws.

So says Howard Rubin, a research fellow at Meta Group Inc. in Stamford, Conn., and a consultant at Cap Gemini America, a software house in New York. Following a two-month review of 20 million lines of code that were "fixed" by clients, Cap Gemini discovered an average of one error in every 2,000 lines of code that were remediated, Rubin said.

THOMAS HOFFMAN

GUINNESS' JOHN STUMPF: Companies "can't catch it all"

While Rubin has a vested interest in plugging Cap Gemini's auditing services, other year 2000 experts support his findings.

"It's a big problem. It's not easy to find every date field, especially in older legacy applications," said Carl Greiner, an analyst at Meta Group, who is a supporter of independent verification.

To put a dollar figure on it, defects brought about during year 2000 repairs are expected to cost U.S. companies between $98 billion and $188 billion to fix, according to Dan Galorath, president of Galorath Inc., an El Segundo, Calif.-based software consultancy. Another way of looking at it: An organization with a portfolio of 100 million lines of code could end up with 50,000 programming errors.

The findings, obtained by *Computerworld* last week, reinforce the need for organizations to hire an independent

Y2K code, page 95

NEWSPAPER

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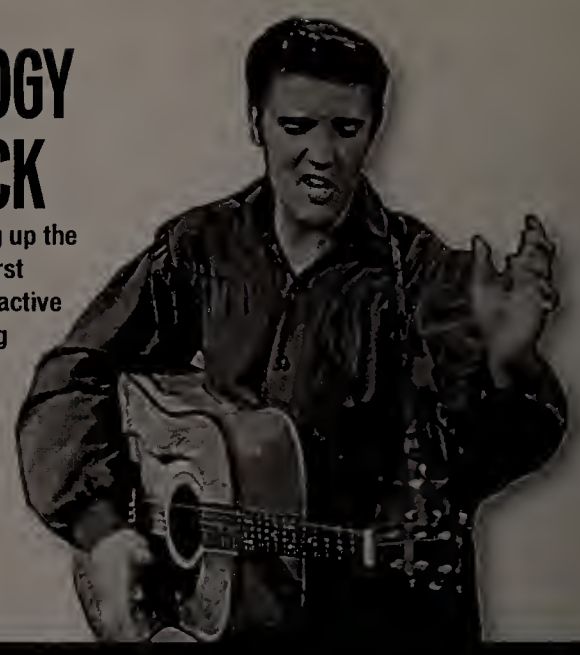
MARC BERLOW

GOLDEN LEADER

Dave Weidenfeld (pictured) has the final legal word on McDonald's Corp.'s IT contracts. He shares what he's learned in that role. Page 54

TECHNOLOGY FLASHBACK

While Elvis was flying up the charts in 1956, the first widely available interactive computer was making its debut at MIT. Page 78



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81 **HEALTH CARE HIRES** those whose skills (and bedside manner) are scalpel-sharp.

"I DON'T THINK [MICROSOFT] NEEDS TO BE PUNISHED AT ALL — IT'S OBVIOUS THEY ARE GOING TO KILL THEMSELVES JUST DRIVING DOWN THE ROAD."

DON STROUD, PLAIN DEALER PUBLISHING, ON WHETHER MICROSOFT'S PERFORMANCE IN COURT IS AN INDICATION OF HOW WELL THE COMPANY IS RUN.
SEE PAGE 12.

Customer Relationship Management

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AT DEADLINE

Salaries on Hold

Despite industrywide pay increases, salaries for technical support staff have barely budged in more than two years, according to a recent survey of 201 companies by the newsletter "Softletter" (*www.softletter.com*) and the Association of Support Professionals, both in Watertown, Mass. Support technicians' pay is holding steady at an average of $32,000.

NEC Reorg Means 15,000 Job Cuts

NEC Corp. plans to cut 15,000 jobs worldwide as part of a three-year reorganization. The Tokyo-based PC and chip maker has suffered deep financial losses worsened by Japan's recession. First up for reorganization is NEC's troubled PC unit, including its flagging U.S. unit, Packard Bell NEC, officials said. NEC expects the PC unit to experience a sales dip of up to 17% and to lose up to $100 million.

Blame the Mainframe

Online stock traders suffered another hit last week when The Charles Schwab Corp.'s system suffered a midday, 10- to 15-minute outage. Officials at the San Francisco company said the glitch wasn't caused by heavy trading volume but was the result of a temporary mainframe malfunction.

Short Takes

SUN MICROSYSTEMS INC. posted its Java 2 source code for download on its Web site (*www.sun.com/software/communitysource/java2*). . . . ACUITY CORP. in Austin, Texas, said it will sell its popular iChat messaging product line to KOZ.COM INC. in Atlanta, a developer of online communities. . . . Web-hosting company VERIO INC. last week said it will use NETSCAPE COMMUNICATIONS CORP.'s messaging platform as the backbone for its nearly 800,000 E-mail accounts. . . . SPRINT CORP. and E-mail outsourcer CRITICAL PATH INC. expect to announce a bundling deal next week in which Sprint's IP SERVICES GROUP will offer an outsourced E-mail package to small and midsize businesses.

VALERO RALLIES TO INSTALL R/3

$5.5B energy firm uses in-house strategy, teams for corporate rollout

BY CRAIG STEDMAN

VALERO ENERGY Corp. had to move fast to install SAP R/3 at its corporate offices and five petroleum refineries.

The key to the whole project — to be completed next week — was the way the company organized itself to quickly roll out the software while making massive business changes.

The $5.5 billion company gave its project team just six months to develop common business processes and start going live with R/3, SAP AG's suite of enterprise resource planning (ERP) applications.

But it also gave team members "the authority to make decisions on how the company was going to operate in the future," said Hal Zesch, Valero's SAP coordinator. Zesch then asked the company's department heads to hand over the employees who could best make those kinds of decisions.

Many ERP users have said successful installations usually depend far more on how companies prepare themselves to use the software than on the technology itself [CW, Jan. 18]. For Valero, urgent business needs added to that challenge.

Behind the Scenes

Valero was in a hurry for several reasons. Acquisitions had thrown together refineries with incompatible, homegrown systems. The San Antonio-based company's central mainframe was sold off with its natural-gas business in early 1997. Valero leased back processing space on the mainframe, but year 2000 problems were expected to start kicking in this year on some applications.

To help speed up the R/3 rollout, which began in late 1997 and is scheduled to reach the final refinery in New Jersey next week, Valero followed a set of rapid-deployment guidelines developed by SAP.

But Zesch said getting the right employees assigned to the project was the most crucial piece of the company's strategy for bringing its business units together on such a tight schedule.

For example, he said, Valero had to create a common set of names for the 65,000 components and materials used in its refineries. Each plant previously had its own naming and data formats, which made it nearly impossible to pass information among systems.

Zesch was looking for workers who already understood how business transactions flowed through Valero's operations. "Within any company, there's a limited number of people who know that kind of thing," he said. "And we didn't have time for them to learn it."

Included among the dozen business users assigned to the refinery rollout were two of Valero's four warehouse supervisors and two of its top purchasing managers. The employees managed the installation themselves and brought in consultants from SAP to augment their knowledge of R/3.

The first refinery went live with R/3 on schedule, and three more plants plus Valero's corporate offices were added last year — allowing it to get off the leased mainframe in December.

The rollout at the fifth refinery began last month.

Valero's experience provides an important lesson. Users "need to consider before they start [an ERP project] just what it is they want to achieve" from a business standpoint, said Jim Shepherd, an analyst at AMR Research Inc. in Boston. Otherwise, they may have to go back and do almost another full implementation to get it right, he added. ◗

JUST THE FACTS

Refining IT

The company: Valero Energy Corp., the fourth-largest independent oil refiner in the U.S., with revenue of $5.5B last year.

The problem: Acquisitions left Valero with corporate offices and five refineries that ran on incompatible homegrown systems.

Its strategy: Install SAP's R/3 applications and design common business processes and data formats.

Delta/Baan Venture Among Largest in Sales Automation

Airline swaps out homegrown code for Y2K fix

BY STEWART DECK AND CRAIG STEDMAN

The $9 million, 1,200-seat contract Delta Air Lines Inc. announced last week with Baan Co. N.V. is one of the largest of its kind. And it's just the latest piece of a huge, ongoing information technology overhaul designed to bolster sales, scheduling and customer service efforts while solving the airline's year 2000 problem.

Delta will replace a 4-year-old, homegrown sales-automation system with the Baan-FrontOffice software. When the installation goes live in September, the software will allow Delta's sales force to comb through the company's customer records and find the best and overlooked sales opportunities through integrated data models.

"The primary purpose of turning to this now is Y2K," said Mark Sohl, a vice president at Delta Technology, a subsidiary of Delta Air Lines in Atlanta.

After a time-consuming IT partnership with AT&T Corp. in the mid-'90s fell through, Delta was left trying to figure out how to handle its year 2000 problem and other IT needs. The answer: a four-year overhaul to rebuild the airline's entire corporate network, database and IT infrastructure.

This year, the third of rebuilding, the airline will spend approximately $390 million building new revenue-management and sales force systems, updating its scheduling system, shoring up its pricing system and installing intranet training systems and a boundary-breaking middleware system to track passengers and flights [CW, Jan. 11].

As far as the Baan piece goes, replacing old code was the company's year 2000 answer to fix that sales system, Sohl said. "A year ago, we were a poster child for how not to do Y2K," he said.

The fix carries business benefits as well. Sales force automation software and other emerging customer-relationship management technologies have the potential to improve the effectiveness of sales and marketing workers by automating manual tasks and giving workers better access to corporate data, said Steve Bonadio, an analyst at Hurwitz Group Inc. in Framingham, Mass.

"But most companies are still taking their baby steps into this arena," Bonadio said. Delta's purchase isn't the largest sales force automation deal that has come along, he added, "but you don't see these kinds of things every day."

Other steps Delta is taking in its IT project include adding capacity to its core NCR Corp. Teradata database, updating Oracle-based data marts and adding new desktops and servers from Hewlett-Packard Co., Sohl said.

Baan said it has signed larger deals for BaanFrontOffice software, but Delta's installation will be much larger than Baan's typical sales force automation sale of 300 to 600 end users. ◗

JUST THE FACTS

Delta's IT improvements

Spending in 1999: $390M to improve IT infrastructure

What does it include? Sales force automation, core database capacity upgrade, data marts and middleware

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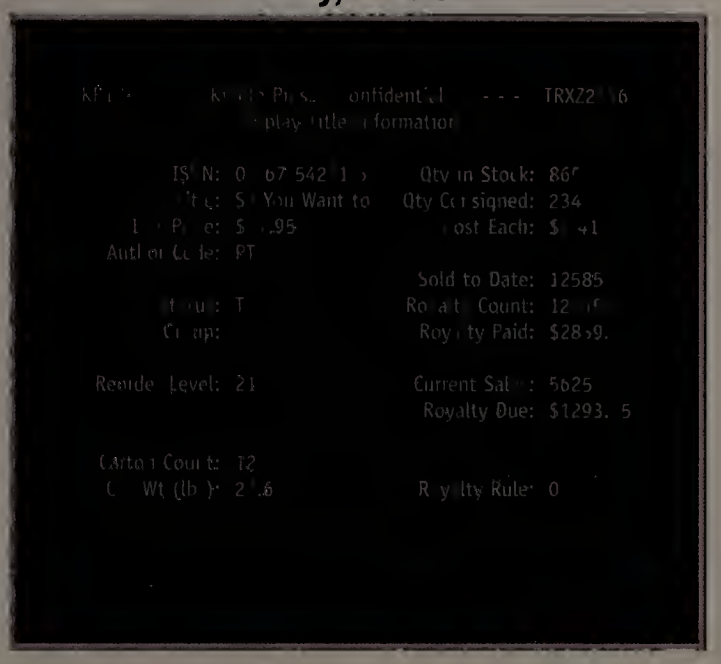

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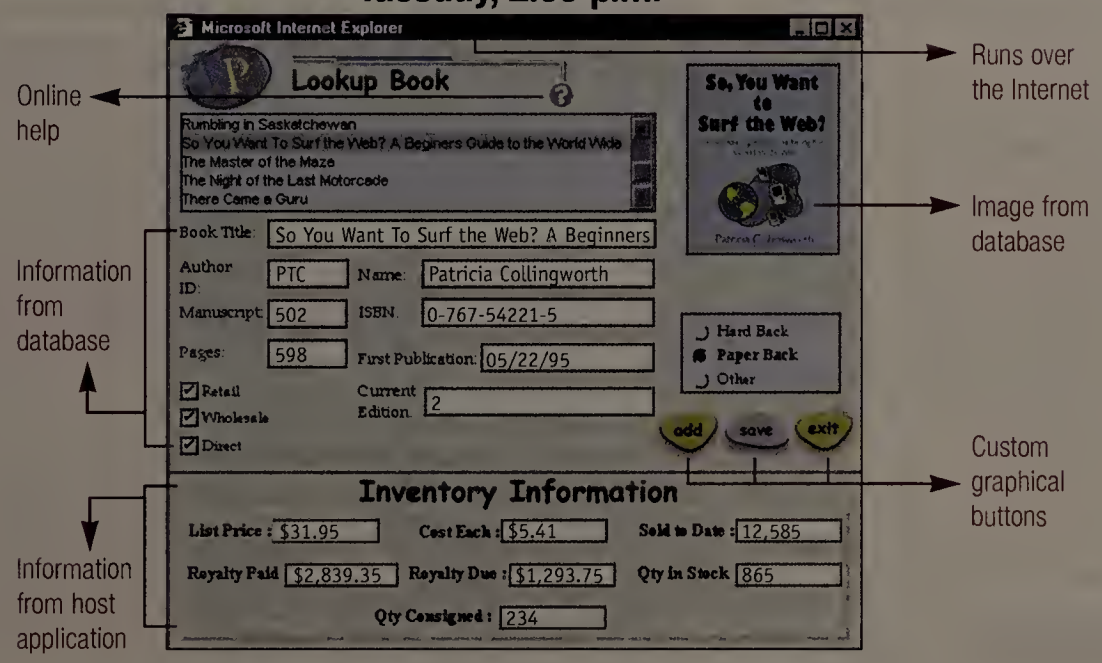

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Schwab Simplifies Web Trade Architecture

Goal to avoid outages, ease management

BY CAROL SLIWA

Skyrocketing growth is pushing Charles Schwab & Co. to simplify the architecture of its online trading application to reduce the chance of outages and to ease systems management tasks.

Customers will take a more direct route, with fewer network hops, from Web browsers to the San Francisco brokerage's clustered IBM and Hitachi mainframes — the big iron that anchors its business. Schwab is seriously considering eliminating its Unix-based IBM CICS middleware tier and possibly even shifting its Web servers to the mainframe for its online trading application, officials said.

Analysts said that tack represents a marked departure from the more common multitier approach, which includes Web browsers, Web servers, middleware and back-end databases. Companies see the server-heavy, multitier tack as an easy way to build, manage and change the individual application components.

But in the high-volume, high-transaction world of online trading, companies have been scurrying to find better ways to ensure that their sites don't suffer outages such as the one that plagued ETrade Group Inc. for less than two hours over three days earlier this month.

Schwab's approach may not be the optimal choice for every high-volume site, said David Floyer, president of IT Impact, a market research consultancy in Mountain View, Calif.

Whether a company should consider that strategy depends on a wide range of factors, including the number of users, response time requirements, business processes involved and volume of transactions. "Banking and online trading systems are a classic example of where you would expect to be pushing the envelope," Floyer said.

Schwab's online trades have soared from an average of 93,000 per day in the fourth quarter of last year to 153,000 per day in January, according to statistics released last week. With its 2.2 million accounts, Schwab is tops among online brokers, according to Concord, Mass.-based Gomez Advisors Inc.

"We have a large user base that expects full functionality 24-by-7 with no excuses," said Lisa Villarreal, senior vice president at Schwab's data access service group. "It's not cheap, and it's not easy."

When Schwab originally built its online trading site, IBM's CICS 6000 middleware — running on a configuration of close to 100 IBM AIX boxes — was a fundamental piece of the puzzle.

It helped direct traffic and manage sessions. Even more critically, the CICS middleware was essential to do the TCP/IP-to-SNA protocol conversion that enabled Web browsers to talk to the mainframe cluster.

But the company is seriously considering shifting those functions to a new version of IBM's OS/390 mainframe operating system. Version 2.6 makes the TCP/IP stack much faster, and it would let Schwab scrap the CICS software running on AIX. The company would then run CICS on the mainframe only.

Another key factor enabling simplification is the IBM Parallel Sysplex environment, which lets Schwab's five mainframes link together and act as one huge machine that submits queries against its DB2 database engine. ◗

FORD TURNS TO DELL TO STANDARDIZE DESKTOP

IBM to be replaced as server provider

BY BOB WALLACE

LOOKING TO TIGHTEN the vise on computing costs, Ford Motor Co. last week signed one of the largest desktop computer contracts ever with Dell Computer Corp.

In a joint release, Dell and Ford said the deal, which has an estimated value of at least $20 million to $50 million, will lead to significant total-cost-of-ownership savings (see related story at right).

"We based our decision on three criteria: product, service and price," a Ford spokesman said. "Our belief is [that] by buying and deploying common, high-quality hardware, we can minimize the cost of support and lower our overall total cost [of ownership]."

"They can expect to save 15% to 20% annually over going with diverse models," agreed Rob Enderle, an analyst at Giga Information Group Inc. in Cambridge, Mass. "It's hard enough to standardize on one vendor. Every aspect of support will become much easier this way."

The contract actually is an extension of an existing arrangement in which Dell provided Ford and all its divisions except Mazda Motor Corp. with PCs and laptop computers. Ford and Dell wouldn't divulge the number of units or the contract value. Ford has been putting out its desktop contract for bid every three years.

The big change under the new contract is that Dell wrestles Ford's server business away from IBM and expands its reach into the automaker with new business at Mazda.

Just a few years ago, IBM was Ford's primary provider. But it has since lost Ford's PC and laptop business and now is losing its server business as well, according to a Dell spokeswoman.

Industry experts lauded Ford's decision to standardize on one PC laptop model, Dell's OptiPlex GX1, which will be equipped with common hardware, software and Ford applications for use around the world.

A contractor working with Ford's information technology group who asked not to be named said deploying the equipment worldwide was a big factor in the decision to go with Dell. "A big part of it is installation," the source said. "Ford's a global company and is thinking beyond Michigan to South America, South Africa and New Zealand."

That may surprise some, because Ford cut a five-year, $300 million deal with IBM Global Services last month to help handle application development. IBM Global Services and IBM's PC server unit both declined to comment. ◗

JUST THE FACTS

Ford, Dell Join Forces

Dell will provide Ford: OptiPlex GX1 PCs, Latitude CPI notebooks, PowerEdge 2300 and 6300 servers

Users: Ford, Lincoln-Mercury, Mazda and Jaguar

Contract value: Not available

SOURCE: DELL COMPUTER CORP., ROUND ROCK, TEXAS

Pact Lays Out Five Roads to Savings

Under a huge pact signed last week with Dell, Ford said it expects to realize significant cuts in total-cost-of-ownership costs in several areas.

According to Dell, those savings will materialize in the following ways:

- **Hardware:** Large-scale purchases will result in lower prices.
- **Software:** Support effort will be greatly reduced, and enterprise software licensing will result in less ad hoc procurement and lower costs.
- **Service:** Remote software configuration will replace manual work and reduce mean time to repair and lower service inventories. And incremental repair costs will be eliminated as repairs are covered in maintenance contracts.
- **Personnel:** Informal support workers will be free to do their real jobs.
- **Operations:** 90% fewer purchase orders will be processed and there will be no cascading charges as replaced computers are moved and reinstalled.

– Bob Wallace

JBusiness App to Integrate With NetDynamics

BY CAROL SLIWA

Novera Software Inc. today will announce that its JBusiness application servers will be integrated to work with Sun Microsystems Inc.'s NetDynamics application server.

When a company selects an application server, it typically has been locked in to that product's environment for any applications written to work with that server.

Atlanta-based Home Depot Inc., which was using both the Novera and NetDynamics products for different applications, now can exploit the strengths of each application server environment. Home Depot found NetDynamics' product good for building Web pages dynamically, and Novera was helpful for building distributed business objects that pull information out of relational databases, said Curtis Chambers, manager of distributed application architecture.

Novera in April plans to release a version of its JBusiness 4 application server that will let business objects written with its tools work with NetDynamics' application server and studio environment. ◗

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BRIEFS

SEC Database Tracks Brokers' Y2K Status

The Securities and Exchange Commission (*www.sec.gov*) posted a database on its Web site to let investors check the year 2000 readiness reports disclosed by brokerage firms and mutual fund companies. The database has more than 13,000 disclosure reports, including total project costs, potential business risks and contingency plans.

Power Outage Stalls Intuit Electronic Filers

TurboTax users who planned to file their tax returns electronically were stopped cold around noon last Monday after a 10-minute power outage brought down the Intuit Inc. servers that receive tax data. Once power was restored, Intuit staffers spent nearly 32 hours running systems checks. The servers were back in business by 8:30 p.m. Tuesday, the company said.

Inacom, Vanstar Complete Merger

Computer distributor Inacom Corp. in Omaha has wrapped up its acquisition of Vanstar Corp., an Atlanta-based reseller of PCs and PC servers. The deal makes Inacom, with combined revenue of $7 billion and more than 12,000 employees, one of the largest players in the technology services sector.

Short Takes

AVISTA CORP. in Spokane, Wash., said it completed year 2000 testing at its 11 power-generation facilities without finding a single embedded controller or subsystem likely to cause trouble. . . . Application development vendor Micro Focus Group and its subsidiary Intersolv adopted the name of MERANT PLC last week. . . . MESSAGEMEDIA INC. has called off negotiations with E-mail content distributor Inquisit Inc. . . . JOHN ALEXANDER, former CIO at UNUM CORP. in Portland, Maine, has joined IMRGLOBAL CORP., a Clearwater, Fla., IT services firm, as director of insurance and financial services.

USERS: JAVA CLONE WOULDN'T BE 'COOL'

Microsoft cleared to brew its own Java; users say thanks, but the original is fine

BY DAVID ORENSTEIN AND CAROL SLIWA

MICROSOFT Corp. last week regained some legal footing to develop its own Java technology, and some partners said Microsoft is pondering Java-like improvements to its Visual C++ tool.

But users said they are skeptical the software company can build a better Java than the Sun Microsystems Inc. original.

Late last week, Judge Ronald Whyte ruled that an earlier injunction against Microsoft doesn't prevent the company from developing a version of Java free of any of Sun's code. Whyte is presiding over Sun's lawsuit against Microsoft in U.S. District Court in San Jose, Calif. (see story at right). That November 1998 injunction said it was likely that Microsoft was violating Sun's copyright with unauthorized alterations of the Java language using Sun's code.

Before last week, Microsoft already had begun to talk with some of its technology partners and customers about a potential new language, code-named "Cool," that would be derived from C++ but would incorporate many Java-like productivity enhancements.

Visualize These

Microsoft has expanded its core set of Visual development tools since the 1991 introduction of Visual Basic:

TOOL	INTRODUCED
Visual Basic	1991
Visual FoxPro	1992
Visual C++	1993
Visual Basic for Applications	1993
Visual Interdev	1997
Visual J++	1997

Among the possible improvements: eliminating memory leaks and some pointers, which programmers find difficult, and developing applets that can run in Internet browsers.

"They've learned a lot from Java," said an executive at a partner company that has been briefed about Cool. Another developer at a partner company added, "I think the idea is: 'Let's make a language that is similar.' "

Microsoft officials publicly asserted that Cool has little to do with Java and is instead based on making C++ a more productive language.

Corporate developers said they would welcome improvements to existing Microsoft tools such as C++, but many were skeptical that the benefits of a new Java-like language would be sufficient to make the switch worthwhile.

"Who needs another language?" asked Keith E. Carpenter, a vice president of client access systems at The Chase Manhattan Bank Corp. in New York. Java does a good job of improving on C++ already, he said, and any language Microsoft develops will probably work only with Windows. "I'm not interested in it at all," he said.

Curtis Chambers, manager of distributed application architecture at Home Depot Inc. in Atlanta, agreed. "I think the last thing we need to do is come out with another language," he said. "The advantage of Java — and what scares Microsoft — is multiplatform."

Michael Risse, a Microsoft development tools product manager, last week acknowledged that the company has discussed a technology termed Cool. But he declined to describe any specifics. Last October, at its Professional Developers Conference, Microsoft demonstrated a possible aspect of Cool: language extensions to C++ that would make accessing COM+ — an enhancement of Component Object Model — services easier.

Risse said part of Cool's mission would be to improve existing development tools, not necessarily develop a whole new language. Risse and Microsoft group program manager Charles Fitzgerald insisted that Cool has nothing to do with the Java lawsuit.

There are still differences of opinion within Microsoft about what direction Cool ultimately should take, Risse also acknowledged. "We scrub ideas," he said. "It's a process of review and analysis."

Analyst Larry Perlstein at Dataquest in San Jose said Microsoft probably isn't working on a whole new language to try to replace Java or C++. What's more likely, he said, is that Cool is part of the natural upgrade path for C++, which represents a shrinking but still very lucrative market for vendors such as Microsoft.

Any new Microsoft language would have a ways to go to catch up to Java technologically and in terms of market appeal, added Shawn Myron, a financial systems analyst at BC Tel Mobility in Barnaby, British Columbia. ◗

MORE THIS ISSUE
What is Cool? For columnist Frank Hayes' guess, see page 72.

Corrections

Two Feb. 15 News articles ["Retailer Commits to Linux in 250 Stores," page 1, and "Linux Who? Most IT Folks Don't Know It," page 97] incorrectly described Linux as shareware. The Linux operating system is free, or costs relatively little, but it isn't shareware, which is offered free for a trial period but then must be purchased.

A Jan. 18. Business article ["Champions of Women in Technology," page 46] misstated the title and company name of Polly Moore at Genentech Inc. She is executive director of biocomputing. The same article also misstated the title of Debra Chrapaty. She is president and chief operating officer at ETrade Group Inc. Also misspelled was writer Anne Gingras' E-mail address. It is agingras@aol.com.

A Feb. 8 Technology article ["Client/Server Career Boosters," page 88] misstated the title of Becky Drahos. Drahos is application administrator of J. D. Edwards software and technology project manager for the city of Orlando, Fla.

Microsoft Wins A Round – Finally

Microsoft can pursue independent Java technology development, according to a ruling last week in its legal battle with Sun Microsystems. But even if Microsoft succeeds in sustaining its newfound freedom, it isn't clear what it will do with it.

At Microsoft's request, U.S. District Judge Ronald Whyte in San Jose, Calif., clarified the injunction he imposed last November against the company in the 2-year-old case. He ruled that the injunction doesn't forbid Microsoft from independently developing Java technology, as long as the company doesn't use Sun's code.

"This clarification is one step in this overall case, but it is important to the marketplace that innovation not be restrained," said Microsoft attorney Tom Burt.

But Microsoft still wants an explicit ruling that its contract with Sun allows it to develop Java technology while the overall case is still pending. A hearing on that request is set for March 12.

Because Whyte in his injunction said Microsoft might be violating Sun's Java copyright, Microsoft hasn't said what it plans to do in the long term with Java, which it insists needs improvements. Analysts last week said they doubt that Microsoft will drop Java support.

Sun spokeswoman Lisa Paulson said to pursue Java development, Microsoft can't use any of Sun's code or use Sun's specifications or documentation. And Microsoft's technology would have to pass a compatibility test.

– David Orenstein with Kathleen Ohlson

SAP to Patch Up New Supply-Chain Tool

BY CRAIG STEDMAN

SAP AG early next month plans to finally ship a critical software patch that's needed before early users of its new supply-chain planning tool can go live with the product.

The patch is supposed to let users feed production and distribution plans prepared by the Advanced Planner and Optimizer (APO) back to the German vendor's R/3 business applications.

SAP now has just a one-way link for sending data from R/3 to APO, which was released late last year [CW, Jan. 18]. The two-way interface "has to be there," said Shawn Mullen, APO project manager at Mott's North America in Stamford, Conn. APO is "an island now, with no bridges back" to the juice and applesauce maker's R/3 system, he added.

But Mott's expected to get the required patch from SAP this month or back in January, Mullen said. The March delivery now being promised forced Mott's to delay, from next month to May, a rollout of APO as part of its vendor-managed inventory program.

Use of APO for demand planning and wider inventory replenishment had to be moved back from May to June, Mullen said. Mott's still expects APO to pay for itself in less than a year by improving sales forecasts and lowering inventory costs, "but we're holding our breath" that the patch works properly, he said.

Two-way interfaces are "absolutely crucial," said Steven Cole, an analyst at Forrester Research Inc. in Cambridge, Mass. "Without links back to R/3 or some other execution system, a plan [built by APO] is essentially a dead end."

Planning software vendors such as I2 Technologies Inc. and Manugistics Group Inc. "wouldn't be in business" without such ties to R/3 and other enterprise resource planning systems, Cole added.

Mike Maguire, director of supply-chain solutions at SAP, said there "was no way we could have predicted all the touch points that [users] wanted back to R/3."

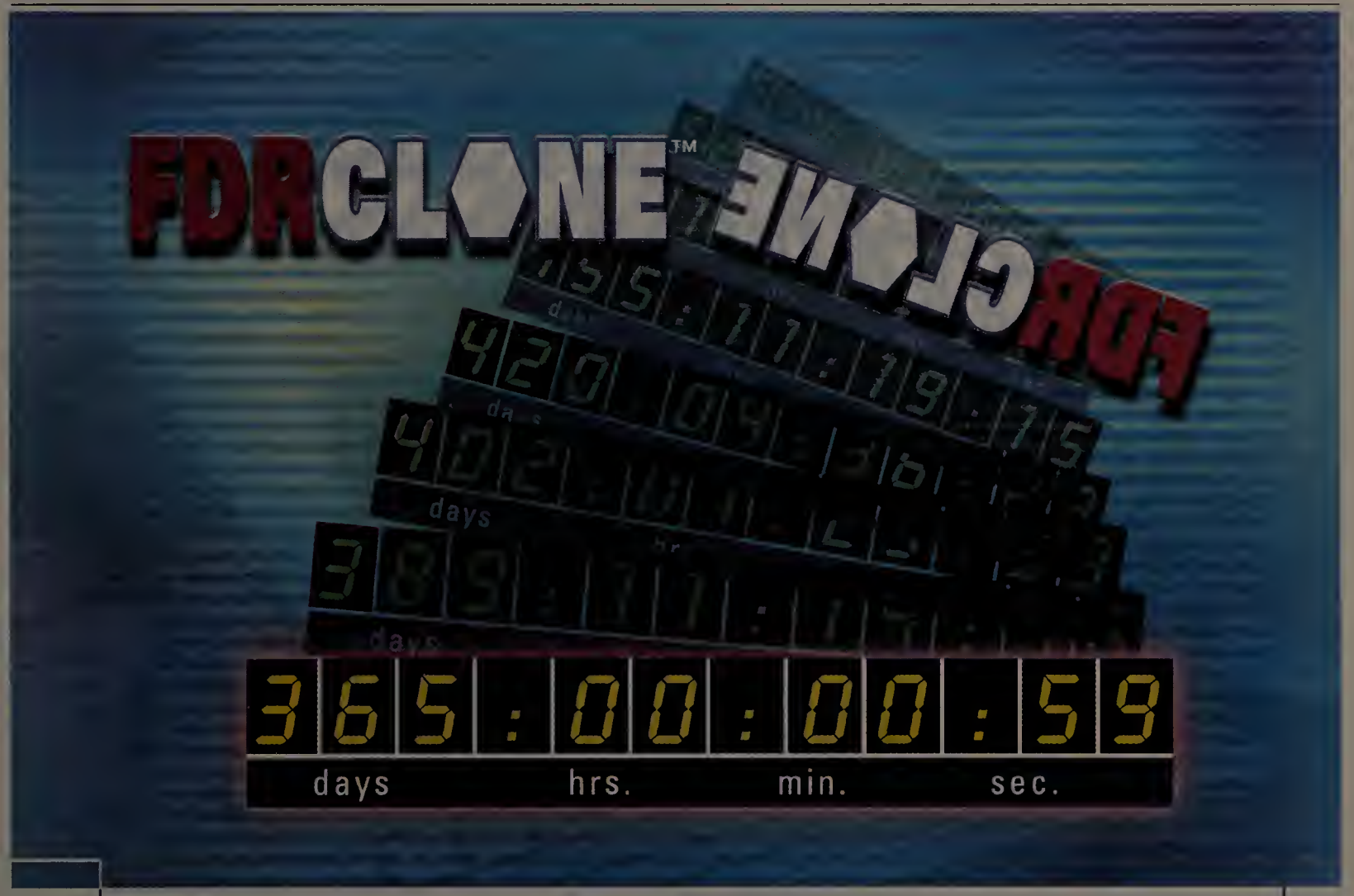
SAP last month sent out a development SWAT team to find out what additional functions early adopters of APO needed, Maguire said. An initial software patch with expanded support for international languages was released two weeks ago.

Where It's At

The status of links between supply-chain planning tools and SAP R/3:

I2: R/3 interfaces are available for all of its tools, but links for demand and distribution planning are still being certified by SAP

Manugistics: Interfaces based on C++ are available now, but a more user-friendly R/3 connector is due out by midyear



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Sun's Datacenter.com to Help Customers Get Web-Ready

BY JAIKUMAR VIJAYAN

After years of trying to vault into the data center arena, Sun Microsystems Inc. may have found a new route using its Internet savvy.

The company last week unveiled a long-term strategy called datacenter.com, through which it will offer a range of hardware, software, financial and implementation services to prepare data centers for the Web and electronic commerce.

"Sun's vision of datacenter.com blends the predictability and security our customers demand" with the opportunities of the Internet, said Rick Lessard, vice president of technology at Equifax Inc., an Atlanta-based provider of consumer credit reports. The company is using a Sun Ultra 10000 high-end server to store and manage credit records migrated off a mainframe.

Sun wants to help customers build highly scalable, reliable platforms to host Web-enabled data center applications, said Anil Gadre, Sun's vice president of marketing. The move comes at a time when most of the major hardware vendors are setting out similar strategies. IBM is considered well ahead of the pack, but rivals such as Hewlett-Packard Co. and Compaq Computer Corp. are still piecing together a long-term Internet strategy.

What's in the Bag

Sun will offer servers with mainframe-like partitioning technologies, high-availability clustering and a range of services, such as custom installation, server consolidation and high-availability programs.

Such services are crucial for corporations looking to do business via the Web, said Mike Ryal, executive director of national systems at BT Office Products International, a $1.6 billion distributor of general office products in Deerfield, Ill.

"Reliability and scalability are not negotiable" in building that sort of effort, said Ron Bowman, manager of electronic business marketing at BT's data center in St. Louis.

Not all the capabilities and technologies offered under datacenter.com are new. Sun has helped customers with onsite installations and configuration services for years. But bringing it all under one service umbrella should focus the company's efforts more effectively, said Joyce Becknell, an analyst at Aberdeen Group Inc. in Boston.

As part of the effort, Sun last week introduced new systems based on its highest-end 400-MHz UltraSPARC chip, which has new performance-boosting interconnect technology for building highly scalable servers. Sun also announced Sun Cluster 2.2, the latest version of its Full Moon clustering software for high availability.

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MANY SEE DOJ WIN, MICROSOFT GAFFES

Courtroom errors believed to have cost company its case; observers' attention, debate turns to pushing various remedies

BY PATRICK THIBODEAU
WASHINGTON

MICROSOFT appears to have sunk its antitrust defense with a series of courtroom missteps and inept actions that have astounded users and legal experts.

Don Stroud, director of MIS at the Plain Dealer Publishing Co. in Cleveland, said he has found Microsoft Corp.'s courtroom defense — particularly its ongoing problems with videotaped presentations — "stupid" and "hard to believe."

He said if Microsoft's courtroom problems are any indication of the way the company is run, then remedies may not be necessary. "I don't think they need to be punished at all — it's obvious they are going to kill themselves just driving down the road," he said.

Kidding aside, Stroud said he believes the court will impose some sort of remedy — he just doesn't know what it should be. But it will have to be tough, he said. "At the minimum they are going to get their hands slapped real hard. And if not real hard, then a month from now they will be right back at it," he said.

John Piening, IS director at Ross Stores Inc., a nearly 400-store retail chain based in Newark, Calif., also has been unimpressed with Microsoft's defense. The government is "systematically picking apart any case that Microsoft might have had," he said.

Microsoft's defense has had many problems. Witness testimony hasn't squared with E-mail records, and the company's videotaped demonstrations have backfired.

GARY LAUFMAN

ROSS STORE'S John Piening says the government is "systematically picking apart any case that Microsoft might have had"

There's also a sense in the courtroom that Microsoft's defense team isn't necessarily running the show. After the government — in spectacular courtroom fashion — revealed discrepancies in Microsoft's first demonstration videotape, the company was expected to abandon that strategy. Instead, it kept rolling out demonstration tapes and the government kept poking holes in them.

With only four witnesses left to call, Microsoft's defense is rapidly drawing to a dismal close. But Microsoft officials aren't conceding a thing. Even on their worst days in court, Microsoft spokesman Mark Murray and William Neukom, the company's vice president for legal affairs, meet with reporters and smile.

Last week, the two faced the press after Microsoft Vice President Brad Chase apologized to the court for the company's third botched videotaped demonstration, not counting the earlier Bill Gates film clips.

"Microsoft is winning on the facts and the law," Murray insisted to reporters.

But antitrust expert William Kovacic, a visiting professor at George Washington University Law School in Washington, disagreed. Microsoft's prepared testimony "advances plausible rebuttals to the government's position, but the actual experience in the courtroom has been a severe disappointment," he said. "[Government attorney David] Boies has done a good job on focusing on selected inconsistencies and weaknesses in their [witness] statements."

Even Microsoft defenders such as Robert Levy, senior fellow at the Cato Institute, a libertarian think tank in Washington, saw problems for Microsoft. Levy said Judge Thomas Penfield Jackson will find Microsoft guilty of illegal conduct. "But I really think on the merits, Microsoft has a very compelling case," he said. ◗

DOJ: No Regulatory Remedies Sought

For many, it seems the judge's verdict in the high-stakes antitrust case has become a foregone conclusion: Microsoft will lose [CW, Feb. 15]. Lobbying strategies outside the courthouse reflect that belief.

Special interest groups like the pro-Microsoft group Association for Competitive Technology have begun staking out positions on remedies. The Washington-based association released a survey last week that claimed "Tech Industry Opposes Microsoft Breakup."

And reporters, catching scent of ongoing talks among federal and state officials over the remedy question, peppered David Boies, the lead government attorney, with questions last week about possible steps the government may seek to change Microsoft's behavior.

All Boies would say was that the government wasn't seeking a regulatory remedy – one that would involve some level of regulatory oversight such as those faced by an electric utility. He declined to talk about other options, such as a breakup of Microsoft or forced licensing of its Windows operating system source code.

– Patrick Thibodeau

A Tale of Two Strategies

Government uses old memo to show Microsoft was anticompetitive from start

BY PATRICK THIBODEAU
WASHINGTON

The government reached deep into its E-mail bag last week in an attempt to establish that Microsoft Corp. has a long history of anticompetitive behavior.

A 1990 Microsoft memo outlined in strikingly blunt terms what government officials said was a plan to divide the personal finance software market with Intuit Inc.

But Microsoft Vice President Brad Chase recalled little of the memo on the witness stand last week.

Instead, Chase warned that America Online Inc.'s $4.3 million purchase of Netscape Communications Corp. may tip the browser balance. If AOL makes Netscape its default browser, Microsoft's browser market share could fall to about 40% while Netscape's would climb to more than 70%, he said. Chase said AOL's recent decision to renew its Internet Explorer contract was intended to help the government.

The decade-old Microsoft memo, sent to Chase and company Chairman and CEO Bill Gates, reported on a meeting with Intuit officials. "We'd rather not compete with you," Intuit officials were told. It outlined a plan to let Microsoft develop the personal finance market for its Windows operating systems and allow Intuit to "continue to do a great job on DOS and Mac."

Microsoft officials called the memo an out-of-context snippet. Microsoft later tried to buy Intuit but gave up in the face of U.S. Department of Justice scrutiny.

The courtroom allegations continued last week with Compaq Computer Corp. Senior Vice President John Rose, a Microsoft defense witness. The government charged the company had leaked confidential information about Be Inc. to Microsoft. Rose knew nothing about it, and Compaq attorney William Coston accused lead government attorney David Boies of making a "cheap trial stunt."

Compaq's general counsel said the company made an inadvertent mistake in letting Microsoft know it had been talking to Be. ◗

IBM Works to Support Linux On Its Low-End Hardware

BY DAVID ORENSTEIN
IBM last week said it will work with multiple vendors of Linux to develop and support the freeware operating system on much of its low-end hardware.

IBM jointly announced a deal with Red Hat Software Inc. in Research Triangle Park, N.C.

But Orem, Utah-based Caldera Systems Inc. also said it has a deal with IBM that includes training and certification of Linux professionals, said Nancy Pomeroy, media relations director at Caldera.

IBM has been working on deals with several leading Linux distributors to meet customer demands around the world, said Tom Figgatt, manager of the electronic-business segment of the company's Netfinity servers unit.

Such heavyweight support for multiple distributions of Linux will be crucial to creating interest among many CIOs who are still unsure about what to make of Linux, said Stacy Quandt, an analyst at Giga Information Group Inc. in Cambridge, Mass. She said IBM also will port Linux to its higher-end RS/6000 system.

Red Hat and IBM will develop drivers and other software for Linux to ensure that it works well with IBM's servers and PCs.

IBM will offer users technical support in conjunction with Red Hat for the first 90 days. ◗

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BRIEFS

IBM Engineer to Lead Real-Time Java Group

Sun Microsystems Inc. has selected IBM engineer Greg Bollella to lead the group that will develop a real-time extension for Java – a critical element to enable Java to work in embedded devices, sources involved in the process said. IBM has yet to select participants for the real-time Java expert group.

SEC Ends Review Of PeopleSoft

PeopleSoft Inc. last week said the Securities and Exchange Commission has ended a review of its accounting on two acquisitions without requiring a restatement of any financial results. PeopleSoft came under review by SEC auditors in connection with acquisitions made last year and in 1996.

J. D. Edwards Buys 3-D Tool Maker

Denver-based J. D. Edwards & Co. said it will buy The Premisys Corp., a small, Chicago-based developer of product configuration software for manufacturers. The $12 million deal is due to close early next month. Premisys' tool supports three-dimensional images of made-to-order products.

NT Upgrade Software Bows

FastLane Technologies Inc. in Halifax, Nova Scotia, has released its DM/Administrator for NT. The software was designed to help information technology managers upgrade from Windows NT 4.0 to Windows 2000. It's available at a list price of $7 per user.

VeriSign Announces Security for PDF Files

VeriSign Inc. has announced its VSDocument Signer, which lets users secure and authenticate Portable Document Format files using digital certificates. No list price is available yet.

DEMAND GROWS FOR NEGOTIATORS

IT counted on to manage outsourcers, too

BY JULIA KING

THIS YEAR, Hilton Hotels Corp. will spend the lion's share of its more than $12 million corporate IT budget on outsourcing. It did the same last year.

For CIO Joe Durocher and Hilton's senior information technology managers, that adds up to a lot of time negotiating deals and then building relationships with outside service providers. All told, Hilton, a $496 million company in Beverly Hills, Calif., has about 40 in-house IT and hospitality business experts who work with the vendors.

BNSF CIO Bruce Freeman sees more business with IT service providers

"Contract negotiation and administration are a very large part of the job," Durocher said. "We're now looking for these skills as part of the overall [IT] skill set."

The reliance of companies on service providers is changing the way technology managers manage. A mix of technical and business knowledge no longer is enough. Instead, an understanding of innovative sourcing strategies, a strong financial accounting background, sharp negotiation skills and a knack for nurturing ongoing business relationships are critical.

Driving this transition is the IT skills shortage, which analysts expect to worsen during the next three to four years.

"The imbalance between supply and demand in IT professionals will continue to grow through 2003," said Karen Rubenstruck, a Meta Group Inc. analyst, speaking at the firm's annual conference last week in San Diego.

One factor is pent-up demand for new IT projects, which 46% of companies have delayed to focus on year 2000 work, according to a recent *Computerworld* survey of 103 companies.

Another factor is the number of vacant jobs. A study last year by the Information Technology Association of America in Arlington, Va., reported 346,000 unfilled positions for computer professionals.

As a result, outsourcing "is going to be part of everyone's life in the IT industry," Rubenstruck said. "Being able to successfully outsource is now a requisite skill for CIOs and senior IT managers."

A growing number of IT organizations already are forming networks of service companies to fill specific IT needs as they arise.

Among these is Fort Worth, Texas-based Burlington Northern Santa Fe Corp. (BNSF), which among other things recently farmed out an enterprisewide rollout of some 12,000 Windows NT workstations to CompuCom Systems Inc. in Dallas.

Unlike a deployment of OS/2 workstations that BNSF undertook several years ago, the NT deployment involves standardized technology in which outside service providers by now have developed extensive expertise, said CIO Bruce Freeman.

CompuCom will deploy just three different configurations of NT, compared with 51 different OS/2 configurations at the railroad company.

Going forward, Freeman said he expects the railroad to increase the amount of business it does with IT service providers. To get ready, it has begun sending IT managers to training classes in negotiating and contract administration.

The railroad also has dedicated a group of purchasing experts to work exclusively with IT as it negotiates with outside service providers. ◗

MORE THIS ISSUE

McDonald's legal counsel offers tips for the IT bargaining table. See page 50.

Early Users Give Nod to Analysis Package

IBM program helps banks target profits

BY STEWART DECK

IBM this week will announce a data warehousing and analysis system packaged especially for banks.

Quick payback and support for some surprising, counterintuitive decisions have been among the benefits early users found with IBM's DecisionEdge for Relationship Marketing analysis program.

"We had a full return on our investment 14 months after installing the data warehouse component," said Jo Ann Boylan, an executive vice president in the Key Technology Service division at Key Corp., the nation's 13th largest retail bank with 7 million customers.

She added that the data warehousing and analysis system helped raise the bank's direct-mail response rate from 1% to as high as 10%. It also helped identify unprofitable product lines.

The IBM package includes application suites, analytical tools, a data warehouse, industry-specific data models and consulting services. Pricing begins at around $150,000.

KEY TECHNOLOGY'S Jo Ann Boylan: The direct-mail response rate rose from 1% to 10%

Peoples Bank & Trust Co. in Indianapolis used the IBM system to delve into some highly profitable bank offerings that turned out to be prohibitively expensive, said Bob Connors, a senior vice president of information services.

System data pointed out how much it actually cost to bring in each highly profitable home equity loan customer.

"Because those loans can be so profitable, it seems like a no-brainer that you'd want to market them," Connors explained. "But we found that the costs to bring them in were far too high, so we've cut way back on that spending. We still offer the loans, but we don't spend so much on advertising or direct mail any more."

Peoples Bank's data warehouse is much smaller than Key's — with only 65 million records — but it is similarly used to better understand its 50,000 customers.

"We recently used it to help identify maturing [certificates of deposit] and offer different types of accounts to those customers to retain those deposits. We achieved 135% of our goal," Connors noted.

Retail Apps Coming

This banking edition follows three similar IBM package releases specifically designed for the telecommunications, utilities and insurance industries. Next up is a similar setup for retailers, IBM officials said, but release dates haven't been announced.

"Data integration is the driving principle" behind these packages, said Richard Winter, an analyst at Winter Corp. in Waltham, Mass. "Large organizations will spend a lot of money on decision-support systems because they want to solve specific, large problems." ◗

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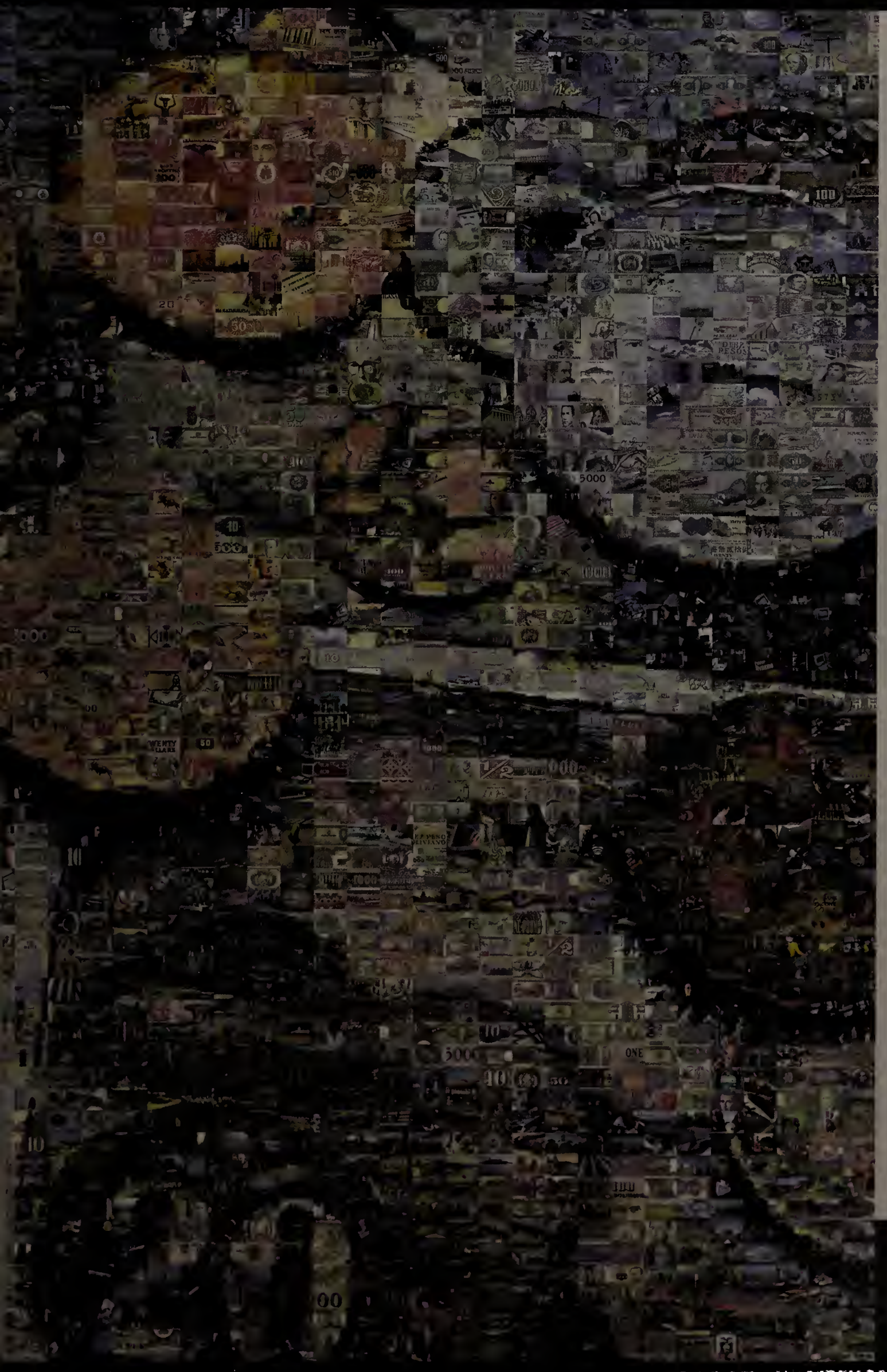

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IBM PLANS VIRTUAL NET ENHANCEMENTS

Handheld support helps remote workers

BY BOB WALLACE

IBM LAST WEEK announced an array of enhancements to its virtual private network (VPN) service that could make it more appealing to companies looking to support remote workers.

Among the improvements are support for handheld devices, access using Asymmetric Digital Subscriber Line (ADSL) services and more robust authentication of VPN users.

VPNs are a collection of secure tunnels that carry data packets over public IP networks such as the Internet. To date, VPNs are most widely used as a less-expensive alternative to modem banks for supporting far-flung end users.

"This is the first I've heard of a VPN provider supporting handhelds, which is a big benefit because many users would rather use handhelds instead of carrying around 5-pound bricks," said Eric Zines, VPN analyst at Boston-based TeleChoice Inc., referring to laptop computers.

Support for handheld devices means users who install an IBM dialer in their 3Com Corp. Palm Pilots, IBM WorkPads or Microsoft Corp. Windows CE units can gain access to their companies' VPNs.

By working with the regional Bell operating companies, IBM is expanding its ADSL pilot program to enable remote workers in more cities to access VPNs using the high-speed service. As of April 19, IBM will support ADSL access in Boston, Chicago, Los Angeles and New York.

IBM also will let companies use Radius servers with its VPN service. Network managers can add and delete remote-access users from their VPN — and reset passwords — using those devices. IBM will support that capability beginning April 30 in the U.S., Latin America, Canada and Europe, with Asia following on June 30.

IBM recently announced that it's selling its network to AT&T Corp., but it will continue developing and selling services that ride over it, which Zines said is a good move for everyone. "IBM will no longer have to worry about the physical network and can focus more on developing new and helpful service features."

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Continued from page 1

Microsoft Plots E-Commerce Bid

Internet group has lacked a full-time leader since December. Microsoft declined to comment on its plans for the San Francisco event.

But according to sources involved in the planning, also on the agenda are details about the vendor's plans for a revamp of its MSN.com portal and the announcement of Commerce Alliance, a new program for systems integrators that specialize in building electronic-commerce sites based on Windows NT and other Microsoft products (see chart at right).

What's Missing

Microsoft already offers several Web products such as Internet Information Server, a generic Web server, and Site Server Commerce Edition, a Web server aimed at online retailers. What's missing, according to analysts, is a clear outline of how the products work with back-end systems and databases — particularly non-Microsoft software.

"When a big company like a bank or big retailer goes online, most of their accounting or inventory data isn't in Microsoft products. It's in IBM mainframes" and other legacy systems, said Scott Smith, an analyst at Current Analysis Inc. in Sterling, Va.

Some information technology shops doubt how well Microsoft products interoperate with their existing core hardware and software, Smith said, and Microsoft should use the event to respond to those concerns directly.

Cambridge Technology Partners Inc. plans to attend and discuss the middleware it's building to fill that IT need, said Sandy Blythe, a vice president at the systems integrator that works closely with Microsoft. Cambridge Technology, in Cambridge, Mass., has signed a deal with Microsoft, in part to help large users install the vendor's electronic-commerce software [CW, Dec. 21].

JUST THE FACTS

What's the Buzz?

Microsoft CEO Bill Gates will host an electronic-commerce marketing event March 4 that is expected to cover:

A soup-to-nuts product strategy designed to convince big IT shops that Microsoft's Web products can handle high-volume online retail sites

Middleware from third-party developers to link Microsoft Web servers to existing systems such as IBM mainframes and non-Microsoft databases

Commerce Alliance, a new group of integrators and Web consultants that specialize in building electronic-commerce sites using Windows NT, Site Server Commerce Edition and other Microsoft products

Details on Microsoft's MSN.com portal revamp, slated to debut in early spring

Insurers' Deal Targets Back-Office Savings

Aegon's and TransAmerica's independent business units may leave IT unscathed

BY THOMAS HOFFMAN

Aside from the customary back-office systems integration and data center consolidation that occur following most multibillion-dollar mergers, Aegon N.V.'s proposed $9.7 billion acquisition of TransAmerica Corp. may not have a substantial impact on either company's information technology operations.

That's because Netherlands-based Aegon and San Francisco-based TransAmerica both boast a bevy of autonomous business units throughout the U.S. that will likely operate independently of one another, analysts said.

"We've been told not to expect any material changes to the financial side of TransAmerica," said George Reilly, director of business systems at the firm's TransAmerica Leasing division in Purchase, N.Y.

Aegon already has a strong track record of integrating U.S. and other insurers it has acquired during the years, including its $3.5 billion purchase of Baltimore-based Providian Corp. in 1997, analysts said.

Aegon executives said they expect the TransAmerica deal to remove $150 million in expenses after three years, though they didn't specify where the savings would come from or how many staff positions might be cut.

The merger is expected to create the third-largest life insurance group in the U.S. in terms of assets and written premiums.

Ira Zuckerman, an insurance analyst at Nutmeg Securities Ltd. in Westport, Conn., estimated that 1,500 jobs could be eliminated between the two companies.

As for IT consolidation, "obviously there's going to be some slippage — you don't need two back offices or two data centers," Zuckerman said.

TransAmerica has about 1,000 IT employees throughout the U.S.

OS/390 Update Emphasizes Web Features

BY JAIKUMAR VIJAYAN

IBM's push to make the OS/390 mainframe operating environment more Web-friendly will gain some momentum this week.

At the Share user conference in San Francisco, IBM is announcing the latest version of OS/390, Version 2 Release 7, which features better connectivity with TCP/IP networks and new network policy management capabilities.

It also boasts better data sharing and management in mixed Unix and OS/390 environments, plus greater security for Web applications.

Due next month, Release 7 will also feature support for the Tivoli Management Agent, which allows an S/390 mainframe system to be managed from Unix servers.

The additional features represent a natural next step in IBM's effort to build more features into OS/390 in the past couple of years, said Dan Kaberon, Parallel Sysplex manager at Hewitt Associates in Lincolnshire, Ill.

"But my guess is that not too many people are going to be putting in any new [OS/390 version] this year," because of year 2000 issues, Kaberon added.

Other features in Release 7 include the following:

- Gigabit Ethernet support for TCP/IP applications.
- Enterprise Extender technology for tighter integration of TCP/IP networks with the older SNA.
- Automated support for digital certificates on the WebSphere Application Server component of OS/390.
- A cryptographic security feature for Unix applications running on an S/390.

Are you ready for the new customer?

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There are two critical dynamics to understand about today's customer. One, nobody has any time. Two, they expect every company to be on the Web. They want it all online—product information, pricing, support, anything that will save them time and money. Sure, relationships are still built on trust, commitment and support. But for this new breed of empowered customer, this **e-customer**, they're based on the Web.

While **e-customers** present endless opportunity, they do pose some challenges. Managing relationships with customers, prospects and partners online is an enterprise-wide task. Systems performance and scalability needs are key. In short, it's got to be done right. Shrink-wrapped solutions will fall short. Experienced partners with customizable products and old-fashioned follow-through will succeed.

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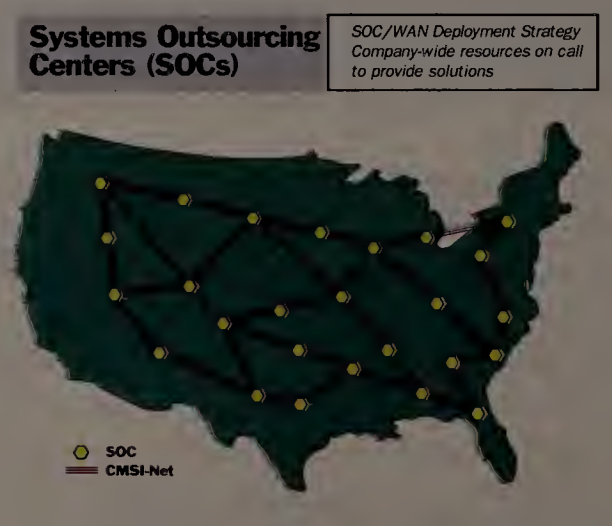
Focusing on the information processing needs of Fortune 1000 companies and state and local governments, CMSI is an expert at the creation, manipulation, and integration of software applications, as well as IT outsourcing, facilities management, and maintenance of legacy and client/server computer systems. With a 16-year track record of success, CMSI has attracted a prestigious list of clients, including Coca-Cola, CSX Corporation, Kemper Financial Services, Lockheed Aeronautical Systems Company, Merrill Lynch, and Wachovia Bank.

The key to the success of CMSI is their staff of highly-skilled, experienced professionals who have extensive, wide-ranging expertise in Internet development, e-commerce, business process re-engineering, strategy planning, evolutionary downsizing, rapid application development (RAD), object oriented databases, vendor software evaluation, and other key technology areas.



In response to clients' needs, CMSI developed a national network of innovative Systems Outsourcing Centers. These "SOCs" enable the company to maintain a repository of re-usable software applications, code strings, and components that ultimately reduce the time and effort needed during the initial development phase of a project. Each SOC is networked to provide CMSI with the ability to staff projects from any SOC or branch location for concurrent development. They also offer on-site consultant and customer training centers that provide complete staging capability to train users of a newly-completed system prior to deployment at the customer site.

CMSI has also created a proprietary Evolution Methodology, which is an integrated set of stages, tasks, work products, techniques, tools, and project management guidelines that provide a standard approach for planning, development, and maintenance. This helps CMSI deliver more productive, cost-efficient solutions in less time than the competition.

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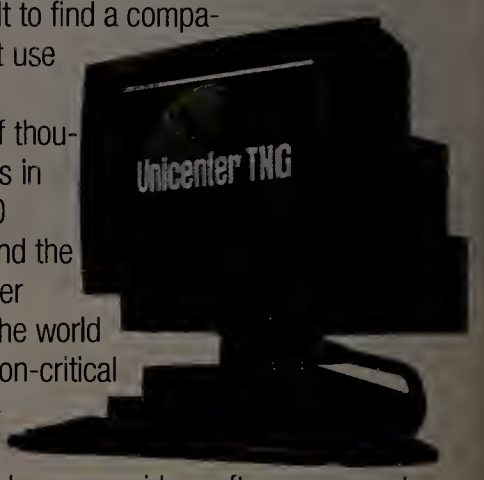

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CMSI Is Great News If You Look At It.

strategic acquisitions like this one.

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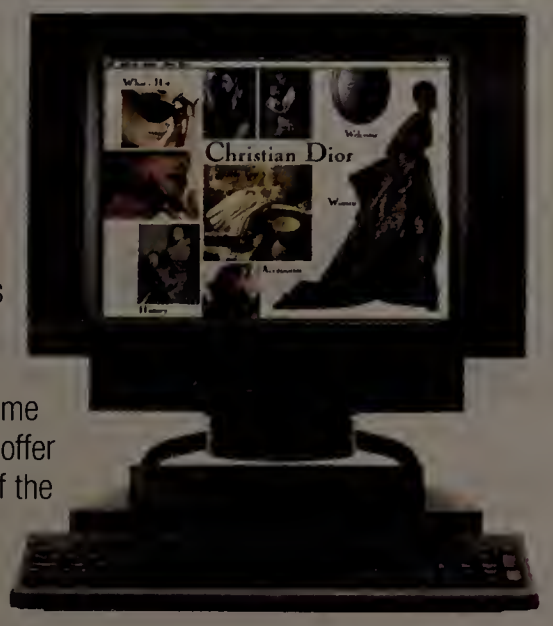

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"This is a very exciting time to be joining the CA family," says CMSI Chairman and CEO Jerry W. Davis, "Our two companies have an ideal fit in terms of technical strengths, business vision, and corporate culture. We're especially enthusiastic about the contributions this partnership will allow us to make globally in high-growth areas such as Internet commerce applications and multimedia content delivery."

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SUPPLY-CHAIN TOOLS FOR ALL

EDS leads group to bring Web-enabled system to users lacking business links

BY STACY COLLETT

ELECTRONIC DATA Systems Corp. said last week it would work with supply-chain and Java developers to integrate their products into a Web-enabled supply-chain system. The move widens EDS services while offering supply-chain capabilities to users who don't have electronic data interchange links with business partners.

"Until now, small companies could have got in the supply chain through electronic data interchange, but it's very expensive," said David Hofferberth, an analyst at Aberdeen Group Inc. in Boston.

Plano, Texas-based EDS will integrate a Java-based supply-chain management system, from Los Angeles-based Paragon Management Systems Inc., and an Internet selling system, from San Jose, Calif.-based Selectica Inc., with a user company's enterprise resource planning (ERP) system.

Once the system is implemented, smaller factories, suppliers, distributors and overseas employees can participate through the Internet using a browser, said Mike Atwood, president of an enterprise services group formed by EDS and its A. T. Kearney Inc. unit.

From the manufacturer's point of view, the Web-based system brings all vendors into view, regardless of their size.

At Philips Semiconductors in Albuquerque, N.M., project leaders are looking for help implementing a Paragon supply-chain management system, said Ken Williams, a plant logistics manager.

"There are several [supply-chain] modules that Paragon offers, and we've only got one module running here. If I wanted to expand, I need resources, and I would rely on EDS to help me integrate them," said Williams, who has one full-time and seven part-time employees on the project.

EDS said its offering, available now, is aimed at U.S. and European companies in high-tech, automotive, aerospace and other industries.

The consortium is the first to offer an integrated Web-based supply-chain package, Hofferberth said. ERP vendors, such as SAP AG, are developing Web-based offerings. But the SAP system won't be available for at least a year, he said. ◗

Links in the Chain

Players in EDS's Web-based supply-chain management offering:

VENDOR	WHAT THEY'RE PROVIDING
Paragon Management Systems Inc.	Java-based supply-chain management software
Selectica Corp.	Internet selling system
A. T. Kearney Inc.	Process re-engineering services
EDS Corp.	Product integration with existing ERP system

MORE THIS ISSUE

Some companies deploy supply-chain software before ERP. **See page 47.**

Meta Data Repository Standard Nears

BY STEWART DECK

Data warehouse users may be closer to a meta data repository standard that will help them tie together data from multiple systems in one place.

Judges of the meta data repository prizefight between Microsoft Corp. and Oracle Corp. say Microsoft landed a thundering punch last week, but Oracle and some analysts say the fight is far from over.

Platinum Technology Inc. — the co-developer and exclusive porter of Microsoft's Repository — announced last week that Repository can be ported to heterogeneous operating system and data server environments including Windows NT for Oracle, Sybase Inc. and IBM DB2 systems and Sun Microsystems Inc. Solaris for Oracle and Sybase.

Microsoft's status and Platinum's position in data warehousing "bring us much closer to a de facto standard," said Craig Bell, a vice president and manager of data resource management at NationsBank Corp. in Charlotte, N.C.

Although they do similar things, "Microsoft's Repository will clearly be available for more databases, whereas Oracle's approach requires that the meta data ultimately resides in an Oracle data server," said Philip Russom, an analyst at Hurwitz Group Inc. in Framingham, Mass. Microsoft and Oracle have battled over which company's scheme — Microsoft's Open Information Model (OIM) or Oracle's Common Warehouse Meta Data — will set the standard.

After Microsoft joined the Meta Data Coalition two months ago, the standards group started integrating OIM into its specifications, and more than 60 developers now are building OIM-based applications.

"Microsoft has certainly moved ahead [of Oracle] and may have even won the repository war," said Richard Winter, an analyst at Winter Corp. in Waltham, Mass. Russom disagreed, calling the coalition "a relatively small organization with limited influence," even if it is the standards arbiter. ◗

IBM Adds Ethernet Switches

Gives Token Ring users a migration option

BY BOB WALLACE

IBM Token Ring users looking to migrate to cheaper Ethernet networks don't have to leave IBM if they change because the vendor last week introduced five more in a growing line of Ethernet switches.

The longtime Token Ring stalwart is fast becoming technology-agnostic, keeping antsy customers in the fold by offering a migration path to Fast Ethernet and Gigabit Ethernet.

In addition, IBM priced the bulk of its Ethernet switches aggressively to combat incumbents Cisco Systems Inc., 3Com Corp., Nortel Networks and Cabletron Systems Inc.

"What IBM has to do is to offer a complete package [that] includes low pricing, reliability and service and support for users," said John Morency, an analyst at Renaissance Worldwide Inc. in Newton, Mass. "Fortunately, with the exception of low pricing, these are attributes that IBM has historically been associated with."

But is it too little, too late? IBM shipped only 0.5% (29,200) of the more than 5.9 million switched Ethernet ports worldwide in the third quarter of last year, according to Dell'Oro Group in Portola Valley, Calif. In the fourth quarter, IBM shipped 1.2% (65,600) of the more than 5.5 million Ethernet switch ports.

The switches will ship in March. Pricing will start at $56 per port. That's lower than the Big Four's prices, and IBM's boxes have the same features as comparable switches. ◗

Lotus Delays Notes and Domino 5.0

Release pushed back to late March

BY ROBERTA FUSARO

They were expected at the Lotusphere show last month. At the show, the Web-friendly Notes 5.0 and Domino 5.0 were promised for release this month, and users said they were content to wait.

Now they will have to wait a little longer.

Lotus Development Corp. last week said it expects to ship the oft-delayed groupware by the end of March. Officials said it's taking longer than expected to tweak the new Web-based user interface and some of the integrated technologies in the Notes messaging client.

It isn't one particular flaw that's being fixed; rather, the company is trying to include as many beta-tester suggestions as possible, said Lotus spokesman Paul Davis.

Release 5.0 of the Notes client boasts a Web look and feel, real-time messaging and improved search abilities. Release 5.0 of the Domino server will include directory and administrative enhancements.

Analysts and users said the delay isn't shocking given the complexity of the product and enhanced user interface.

Most Notes migrations this year will be to Version 4.6, and many users won't upgrade until they prepare for 2000, said Joyce Graf, an analyst at Gartner Group Inc. in Stamford, Conn. "Users are planning and trying out [5.0] in their test labs, but they could do that just as well with the beta version."

Steven Hetherington, project manager at ADP Canada in Etobicoke, Ontario, said the delay isn't a big deal for the unit of Automatic Data Processing Inc. because it's still rolling out Notes 4.6 and wouldn't consider moving to 5.0 until the end of next year. "There are huge expectations around this product, so I'm sure [Lotus] wants to make sure they're getting it right." ◗

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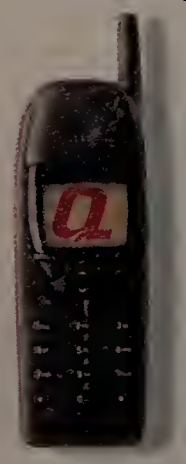

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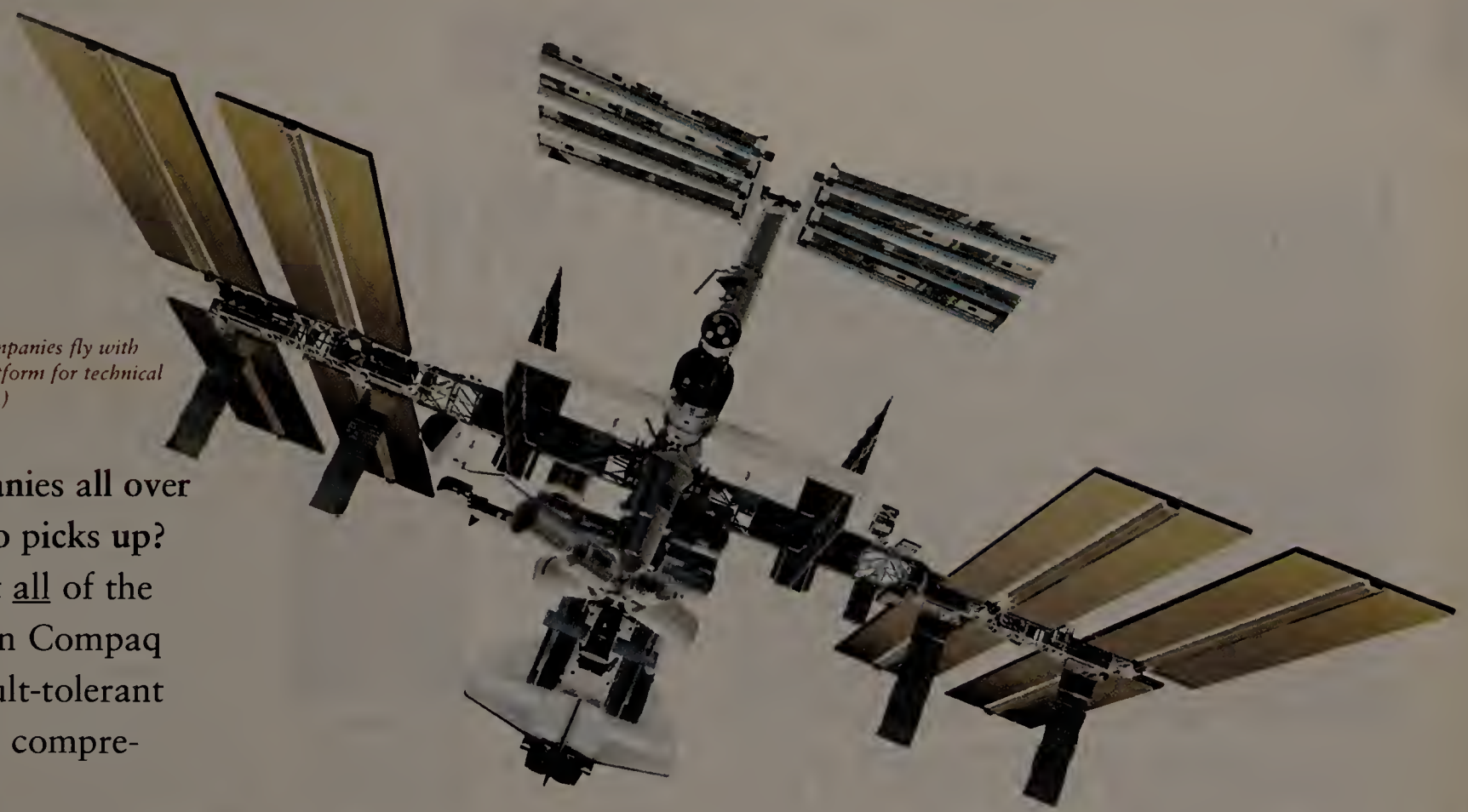

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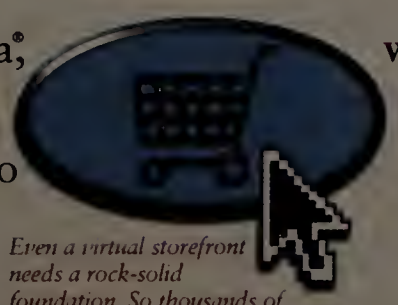

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DUAL CAREER PATHS REDUCE TURNOVER

Practicing companies hold on to top talent

BY BARB COLE-GOMOLSKI

THE PRACTICE of setting up dual career paths in information technology departments — one for technicians and one for managers — is paying off.

It's helping to reduce turnover while enabling companies to build more efficient IT groups, according to those that have done it.

Two career paths also give IT workers two ways to rise in the organization: via the traditional way, by taking on management responsibilities, or by moving up a technical ladder.

In most cases, employees are allowed — even encouraged — to move between tracks.

At AlliedSignal Inc. in Morristown, N.J., turnover among the top technical performers traditionally has hovered around 25%. "[Technical] people were leaving because they felt they had nowhere to go unless they went into management," said Julian Kaufmann, corporate director for IT human resources.

But since the company rolled out a dual career system last summer, "we haven't lost any top talent," he said.

At Kraft Foods Inc. in Northfield, Ill., the practice, which has been in place for about four years, has helped reduce turnover from 9% to 6%. It's not unusual to see turnover in the double digits, even the 20% range.

About 35% of the company's 1,000 IT staffers fall into the technical track, said Margaret Schweer, director of human resources for IT. "You can be very senior in our IT organization as an individual contributor," she said.

ALLIEDSIGNAL'S Julian Kaufmann says techies felt management was their only option

It's important to have a career ladder that satisfies technical gurus, said Linda Pittenger, president of People3 Inc., an IT consultancy in Somerset, N.J.

The lack of a career path for technicians and the tight IT labor market has led to a culture of job-hopping at many companies, observers said.

The dual career track "gives me a sense of control over my own destiny," said Tom LaBonte, lead information systems analyst at AlliedSignal. As a 15-year company veteran who has had various job titles, "I can move into the more technical area, or I can go out and work more with customers [in the business unit]," he said.

The IT department at Sears Roebuck and Co. in Hoffman Estates, Ill., is rolling out a dual career path that will let a technician rise all the way to the level of company officer. "We know what motivates technical people is the work that they do and being recognized for it," said Pam Cox, Sears' workplace transformation manager.

In addition to improving retention, the dual career path push is being driven by a need to shore up certain IT competencies.

For instance, AlliedSignal is buying more packaged applications and needs fewer people to maintain legacy systems, Kaufmann said. "We need more project managers but not as many people managers," he said. The dual career path will make it easier to grow the talent it needs, he said.

Setting up a dual career path often involves reclassifying all IT jobs and introducing new training programs. Cox said it will take Sears about a year to get its program in place. But the extra effort is worth it, Schweer said. "People love playing a big role in the development of their career."

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Smaller ERP Vendors Look to Bulk Up

Lawson to support Java; System Software users to gain add-ons

BY CRAIG STEDMAN

Lawson Software Inc. and System Software Associates Inc. — two of the vendors looking up at the big boys of the ERP business — are both about to go on the offensive.

Minneapolis-based Lawson this week is due to announce object-based technology that will let users of its enterprise resource planning (ERP) applications develop customized user interfaces in languages such as Visual Basic and Java.

That will be followed in mid-March by an upgrade of the Lawson Insight applications that is expected to add features such as improved support for analyzing financial data.

Two weeks from now, System Software Associates (SSA) plans to lay out a new strategy that analysts said is built on surrounding the struggling company's core ERP applications with add-on products from other vendors.

Chicago-based SSA also will demo a promised Windows NT version of its software, but that isn't expected to be ready for several months.

New management brought in last year has cut costs and refocused SSA in an attempt to stabilize the company, which lost $128.7 million in its fiscal year that ended in October.

But it isn't out of the woods yet: SSA last week reported a $5.4 million first-quarter loss on lower than expected sales.

David Caruso, an analyst at AMR Research Inc. in Boston, said the upcoming announcement is essentially an attempt to relaunch SSA after several years of turmoil.

The company can't afford any more missteps, Caruso added. "They're kind of in a zero-tolerance situation right now with users."

Privately held Lawson is in much better competitive shape than SSA, said Jim Holincheck, an analyst at Giga Information Group Inc. in Cambridge, Mass.

But Holincheck said Lawson needs to make working with its software easier to keep up with bigger rivals such as PeopleSoft Inc. and SAP AG.

GARY LAUFMAN

THEY DON'T DO WINDOWS

Demanding refunds for the copies of Windows that they say they never used, about 100 open-source (primarily Linux) software users marched outside Microsoft Corp. offices in Foster City, Calif., on Feb. 15. Similar but smaller protests occurred in other cities such as New York and Tokyo. Microsoft spokesman Rob Bennett said the responsibility of providing refunds is in the hands of PC makers.

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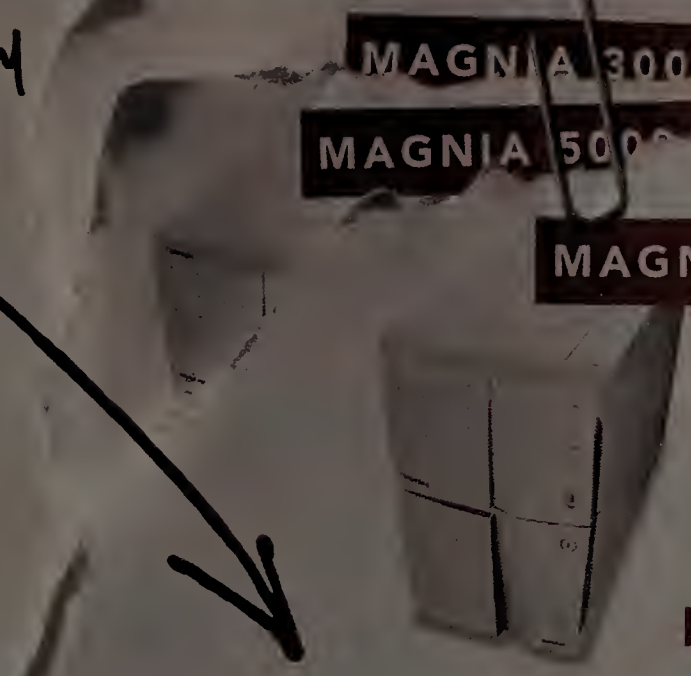

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Web Access to Big Iron Gets Easier, Safer

BY JAIKUMAR VIJAYAN

The latest crop of Web-to-host products is making it easier — and safer — for companies to provide wider access to data on mainframe and proprietary host systems.

Last week, Kirkland, Wash.-based Wall Data Inc. released a new version of its Rumba Office 2000 family of host access products. It features a set of ActiveX controls that lets users access and manipulate host data, including file transfer and printing, from a browser-enabled client (see chart).

Wall Data's announcement came on the heels of a similar one by WRQ Inc. in Seattle. The company's Reflection EnterView 2.0 host access product makes Web-based host access safer through its support of high-end data encryption and of standards such as Secure Sockets Layer and Transport Layer Security.

A centralized Web server, which users log on to, manages the actual access and manipulation of data between the host and client in both cases.

Users need such enhancements to deploy Web-to-host technologies widely, said Stephen Drake, an analyst at International Data Corp. (IDC) in Framingham, Mass.

"There's been a lot of interest from people who want to extend their [legacy] data to new and remote users," Drake said. The market for such products grew from $24 million in 1997 to $90 million last year and may hit $200 million this year, according to IDC.

The better security and the easier deployment of a Web-based system has prompted Grand Rapids, Mich., hospital Spectrum Health to deploy WRQ's EnterView, said Scott Leising, a Web analyst at the hospital. Spectrum Health is using EnterView to give intranet and remote users such as network doctors common access to data on disparate mainframes and Hewlett-Packard Co. HP 3000 systems.

"It gives everybody in the organization a way to cross over the boundaries created by different systems easily and without undue burden on the IS staff," Leising said. ◗

Simplifying Web-To-Host Access

WALL DATA'S RUMBA OFFICE 2000

(Cyberprise Edition)

- Set of ActiveX controls allow host display, file transfer and host printing
- Support for Microsoft and Novell Network Directory Services

WRQ'S REFLECTION ENTERVIEW 2.0

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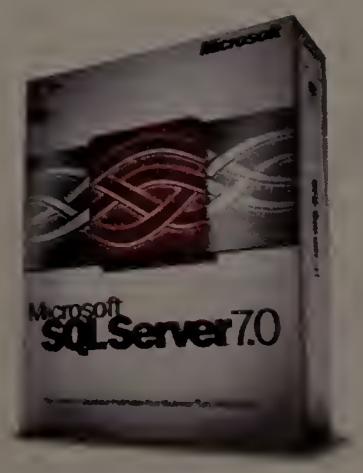

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StorageTek Plans Rebound From Recent Earnings Sag

CEO expects growth from software push

Storage Technology Corp.'s fourth-quarter 1998 earnings weren't as rosy as Wall Street originally expected. Last month, the company posted earnings of 52 cents per share, down from expectations once as high as 77 cents per share (and down from 73 cents per share in the same quarter a year ago). But the Louisville, Colo., company has plans for rapid growth this year. *Computerworld* reporter Nancy Dillon recently spoke with StorageTek CEO **David Weiss** about what lies ahead.

Q: Why did StorageTek fall short of earnings expectations?
A: From a revenue standpoint, we set a new record for 1998 with almost $2.3 billion. But it was still less than what we wanted — only a 5% growth over 1997. Two new products, the Virtual Storage Manager and the 9840 [tape drive], were actually six months late to market.

Although they began shipping in the later part of the fourth quarter, revenue wasn't as great as we wanted.

Q: How do you expect to get back on track?
A: In the high-end tape business, we're seeing strong demand for the 9840 and the [Virtual Storage Manager]. But the real fuel in 1999 will come from new areas. First is the client/server tape and disk area. Then we have our [storage-area networking] initiatives and our consulting business. We expect these three areas to grow faster than the market.

Q: How is storage-area networking [SAN] changing your business?
A: We already started delivering a SAN solution in the fourth quarter. And in about five years, 80% of our revenue could come from SAN-attached products. SANs have also gotten us to focus more on software.

STORAGETEK CEO DAVID WEISS: Hopes to see earnings growth this year from client/server storage, storage-area networking and consulting

In early 1999, we will separate our software into a different business. We did a restatement of last year's earnings and learned that if we had reported software differently, it would have represented $100 million [in revenue]. I expect it to be two to three times that in 1999.

Q: Will this growth come from existing software or future offerings?
A: It will be a combination of both. Plus, we'll have some innovative software that resides on the client and provides Internet-enabled backup.

You should look for an announcement in the first half of 1999 where we'll offer Internet backup as a service you can subscribe to. And [after that], we'll have something called E-mail Archive.

Q: IBM is reselling your Iceberg mainframe disk system as the Ramac Virtual Array, but this agreement extends only through 2000. What's the future for Iceberg?
A: The relationship with IBM has been a win-win scenario.

It has gained us significant presence in the high-end [direct-access storage device] business. But towards the end of this year, IBM will have a new product called Shark that it will migrate towards. At the same time, we're starting to sell Icebergs ourselves.

We've also been working on new features that will be unique to us, so we can sell against IBM Shark and EMC [Corp.]. For instance, we'll introduce a version of Iceberg that can connect to both S/390 and open systems. ◗

COMPAQ SEEKS PORTAL SPIN-OFF

Makes $300M bid for Zip2 Net service firm

BY JAIKUMAR VIJAYAN

COMPAQ COMPUTER Corp.'s proposed purchase of Zip2 Corp. last week should make Compaq's AltaVista Co. subsidiary more competitive with rival Internet portals in advance of AltaVista's spin-off as a separately traded company later this year.

COMPAQ CEO ECKHARD PFEIFFER: Focus is on "Internet leadership"

Zip2 is a privately held, Mountain View, Calif.-based provider of localized Internet services for media companies. It specializes in developing, hosting and maintaining Web-based city directories for customers such as The New York Times Co. and Knight-Ridder Co.

Under the proposed deal, Zip2 will become an operating division of Palo Alto, Calif.-based AltaVista [CW, Feb. 1].

"Compaq's just padding the nest for the AltaVista spin-off," said Cheryl Currid, president of Currid & Co., a consultancy in Houston.

Compaq's Zip2 bid, which a company official pegged at "around $300 million," comes on the heels of the company's just-completed purchase of online retailer Shopping.com.

"What Compaq is trying to do is combine [the capabilities of] a Yahoo with an Amazon.com," said Lindy Lesperance, an analyst at Technology Business Research Inc. in Hampton, N.H.

Compaq's effort to turn AltaVista into a major Internet portal and electronic-commerce site is part of a wider Internet strategy outlined by CEO Eckhard Pfeiffer.

"Compaq has transformed itself from a PC company to a worldwide technology leader. Now we want Internet leadership. That's where Compaq is going next," Pfeiffer told hundreds of journalists and analysts in London last week.

He defined Internet leadership as selling the hardware and services that run the Internet and supplying Internet-enabled products to enterprises and consumers. Pfeiffer pointed out that Compaq servers run four of the top five Web sites and are critical for major electronic-commerce sites such as Amazon.com. ◗

Jana Sanchez, a correspondent at the IDG News Service in London, contributed to this report.

BRIEFS

Venture Capital Breaks Records

Propelled by the surging technology sector, venture capital investments in the U.S. reached an all-time record of $14.3 billion in 1998, a 24% jump over the previous year, according to a survey released last week. The study by PricewaterhouseCoopers in San Jose, Calif., found that venture capital investments in the software and information sector increased 57% to $4.5 billion last year, while Internet-related venture capital investments soared 66% to $3.5 billion.

Microsoft Knocks Caldera Lawsuit

Microsoft Corp. has filed motions to dismiss the antitrust complaint and other charges brought against it by Caldera Inc., a tiny Linux company in Orem, Utah.

The motions and much of the evidence in the case are sealed and unavailable to the public, but Microsoft issued a press release that painted Caldera's claims as groundless. "The way to refute their points was to cite documents under the protective order," countered Bryan Sparks, Caldera's CEO. The trial starts June 7.

Finland's Nokia Buys DSL Vendor

Finland's Nokia Corp. last week said it agreed to acquire Diamond Lane Communications Corp., a maker of high-bandwidth, Digital Subscriber Line products, for $125 million in cash. Nokia hopes that buying the Petaluma, Calif., company will give it an edge in developing its Internet Protocol and Asynchronous Transfer Mode networks market.

SNAPSHOT

Quarterly Earnings Reports

COMPANY	Q4 REVENUE*		Q4 NET INCOME*	
*Refers to calendar fourth quarter	1997	1998	1997	1998
Computer Horizons	$99.6M	$143M	$9.1M	$12.2M
Dell Computer Corp.	$3.7B	$5.2B	$285M	$425M
Hewlett-Packard Co.	$11.8B	$11.9B	$929M	$960M
Software AG	$56.9M	$69.9M	$6.4M	$9.4M

A PC in every home

SUDDENLY, QUIETLY, the PC has become a mass-market consumer phenomenon. The implications of that may be more far-reaching than we anticipate. The arrival of truly low-cost PCs, combined with the gotta-be-there cachet of the Internet, has quickly pushed home computing into the mainstream. Just last month, the industry marked a major milestone when Dataquest reported that more than 50% of U.S. homes have PCs. You're now out of the mainstream if you don't own one.

Early this month, start-up FreePC.com said it was oversubscribed by a factor of 50 to its offer of a free PC to people who met certain demographic criteria. A New Hampshire Internet provider is giving away a free PC to customers who make a three-year commitment to using its Internet service. Then there's Emachines, a Korean company with a fully configured $399 computer that has cracked the best-seller charts after just a few months on the market.

PAUL GILLIN is editor in chief of *Computerworld*. Contact him at paul_gillin@computerworld.com

If you're in a business that caters to consumers, you have to take all this seriously. The PC has gone from geeky extravagance to commodity in less than two years, and most new users will be going online at some point.

How dramatic is the move to the Internet? Well, common sense dictates that growth gets more difficult as companies get larger. However, America Online just added a million new subscribers in the shortest period in its history.

Outside of electronic-commerce-dependent markets, big business has had the luxury of treating the Net as a kind of novelty until now. I was surprised, for example, to find a "happy summer" greeting when I visited the Web site of one of America's largest fruit-juice makers last week. But that kind of blissful naïveté can't last for long. For a new breed of PC-empowered consumers who increasingly are employing high-speed connections, the network is going to replace the Yellow Pages, catalogs and the telephone. If you aren't offering them what they expect online, they're going to move elsewhere quickly.

Ready or not, the PC has gone mass market, and it will change the way you interact with your customers. This train has taken 20 years to reach the station, but now that it's coming, it's moving very fast. ◗

more than 50% of american homes now have PCs

DON TAPSCOTT

Internet stocks are foundation of the next economy

DESPITE PROPHECIES about bursting bubbles, the rationale underlying the enthusiasm for Internet stocks remains rock-solid. Yes, there will be considerable volatility — as we've seen. And there will be big losers, not just winners. But overall and over time, the companies that tie their fortunes to the Internet have but one way to go: up.

There really are three kinds of Internet-related stocks that prudent investors should be holding.

The high-profilers such as Amazon.com, eBay, ETrade and Yahoo are one type, what I call a "pure" Internet stock. These companies didn't exist before the Internet, their whole business model is built around the Internet, and all their revenues derive from transactions on the Internet. Although their share prices have dropped since the beginning of the year, all of these companies have appreciated magnificently from their levels of a year ago. And many still have massive growth potential.

DON TAPSCOTT is chairman of the Alliance for Converging Technologies. Contact him at column@tapscott.com.

The second type is composed of traditional brick-and-mortar companies that are successfully changing their business model to seize the opportunities offered by the Net. Examples include Federal Express and Disney. These companies are less subject to the massive market swings of the pure Internet stocks.

For example, FedEx has totally redesigned its business processes so that fully 60% of its shipments are ordered, tracked and managed via the Web. FedEx customers can use the Internet 24 hours per day to pinpoint the whereabouts of their parcels — and they love it. And FedEx is poised to harvest new markets created by the Web's ability to make even the smallest business a vendor to the world.

Disney is moving much of its movie and theme-park content into the interactive world. Its Go.com portal site opened last month with 8 million registered users and includes some of the Web's most popular sites: ESPN.com, ABCNews.com and Disney.com.

The third type of Internet stock investment involves the companies that make the switches, routers, modems, software and other technology critical to the Net's operation. A good example is Cisco Systems. By 2003, the total volume of com-

merce on the Web is expected to top $1 trillion. It's good sense to invest in the companies that are building the billions of dollars of Internet infrastructure to enable this.

Many decades ago, the steam engine came along. One group said, "No way, we're sticking with horses. There will always be a need for them." The other group said, "Looks promising. We will invest in railroads. And in the companies that build the locomotives. And in the companies that will make the products shipped by rail. And in the new communities that will be built in the new territories opened by the railroad."

The risky strategy was to stick with the stables, saddles and blacksmiths. The conservative approach was to invest in the emerging economy.

DAVID MOSCHELLA

Business lessons from the portal merger mania

THESE ARE CERTAINLY heady times in the portal business. This year, we have already seen industry leader Yahoo acquiring GeoCities and announcing a major alliance with Fox, @Home Network's bid to acquire Excite and, most recently, the planned merger between USA Networks and Lycos.

Last year, Disney grabbed 43% of Infoseek and NBC took 19% of Snap, while America Online acquired Netscape. You might call this a trend, but that would imply some sort of direction. Let's just say the herd has moved.

DAVID MOSCHELLA is an author, independent consultant and weekly columnist for *Computerworld*. Contact him at dmoschella@earthlink.net.

It's easy to scoff at the huge valuations being placed on these still-tiny companies. But maybe this really is just the beginning. Maybe portals will be the places we go to for customized information, news and entertainment, where we can get free E-mail, word processing, spreadsheet and other software services, and where we will house our shopping agents and other bots.

Maybe portals will help us synchronize our calendars, addresses and other personal information. And maybe portals really will be the force that topples Microsoft's desktop-centric empire. Maybe.

But beyond possibilities, little is certain. Consider that the deal between the Fox TV network and Yahoo is largely one of mutual promotion, while Lycos has apparently tied its fate to that of the Home Shopping Network.

In contrast, @Home wants to use Excite to develop an integrated mix of transmission and service capabilities, while AOL bought Netscape to better reach the business and computer-literate communities. And I still can't figure out what Disney and InfoSeek are up to with the Go Network.

Can all of these diverse strategies make sense? Historically, the most successful IT industry acquisitions have occurred when a big company bought a smaller one in a closely related market. Call this the Cisco approach.

The least successful have been those involving two big companies in neighboring layers of the industry value chain. Remember the AT&T/NCR and IBM/Rolm debacles?

Finally, the least consequential have occurred when one company buys another in an entirely different end of our business. Did it really matter that Sony acquired Columbia Pictures?

By this logic, the most dubious deals seem to be those made by AOL and @Home. Each is paying big money for a company well outside of its key area of competency. In contrast, the most natural deal is Yahoo's purchase of GeoCities. All the others are based on some hoped-for content, brand or advertising sales synergy between television and the Web. Network TV executives clearly feel the need to be in the Internet business, but do the portal companies really need to be in the television business?

The answer is no. Just as Barnes and Noble needs to be online but Amazon.com doesn't need to own stores, the Home Shopping Network needs the Web whereas an eBay doesn't need TV. It's that lack of mutual dependence that makes acquisitions such as USA Networks' of Lycos or Disney's of InfoSeek seem so forced, even random, whereas the Yahoo/Fox and Microsoft/NBC alliances appear much more natural. It also helps explain why the two strongest portals — AOL and Yahoo — have managed to remain independent.

But beyond the world of portals, media and advertising, there's a wider lesson. If your company comes from the pre-Web era and you're considering buying or aligning yourself with a pure Web-based rival, remember this: You probably need them more than they need you.

When combined with the compelling potential of the Web, this can easily become a formula for substantial — but perhaps necessary — excess.

Caveat emptor.

READERS' LETTERS

Elegance quest doesn't lead through Windows

IN THE Dec. 21 issue of *Computerworld*, Jim Champy wrote about "The Quest for Elegantly Simple Software."

I'm of the belief that because this is a male-dominated industry, this testosterone type of behavior — the affinity to tinker and conquer — continues despite years of complaints that PCs are cluttered and, to the average end user, complicated.

Usually, when I hear the words *elegant* and *simple* in the same sentence, they're being used to describe the Macintosh operating system. The next version of Mac OS, a major upgrade, will be based on Unix but will have a continuously refined and "elegant and simple" interface.

The question for us Mac zealots is, Will it be "good enough" — words often used to describe the success of Windows in corporate America.

Think level playing field. Think competition.

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JIM CHAMPY's article "The Quest for Elegantly Simple Software" completely misses the point. He gently chides Microsoft for not paying more attention to ease of use, urging Microsoft "to learn more about us and what we need."

Microsoft has never been, and never will be, driven by the consumer. Everything that the company does should be analyzed as either a tactical or a strategic move against its competition. Nothing more and nothing less.

Neil W. Hornbeck
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Just the facts, please

I ENJOYED reading recent articles on year 2000. I am not a computer professional, but I am very concerned about the year 2000 problem. In the past few months, I have noticed a great deal of fear among people about this subject — almost panic.

It is good to have a reliable source of fact-based information — not fear-based.

Vicki Hinkle
hinkles@alpha.wcoil.com

Looking for a break

I HAVE BEEN following the many articles you've had recently about older workers ["Pay, Hot Tech Block IT Vets," CW, Dec. 14]. From 1992 through mid-1994, I worked less often than I was "on the bench" as a contractor. I spent thousands of dollars on PowerBuilder training, a very hot skill at the time.

Despite having been told by several agencies that I could find work, I could not find contract work (at a greatly reduced rate) or a permanent position. I even offered to work for nothing to get experience. I was barely past 40 then.

Luckily for me, the expanding economy allowed me to go back to doing the same work I had previously, but I know I soon will be facing the same situation.

Companies don't want to train us, but they won't hire us even after we pay for the training.

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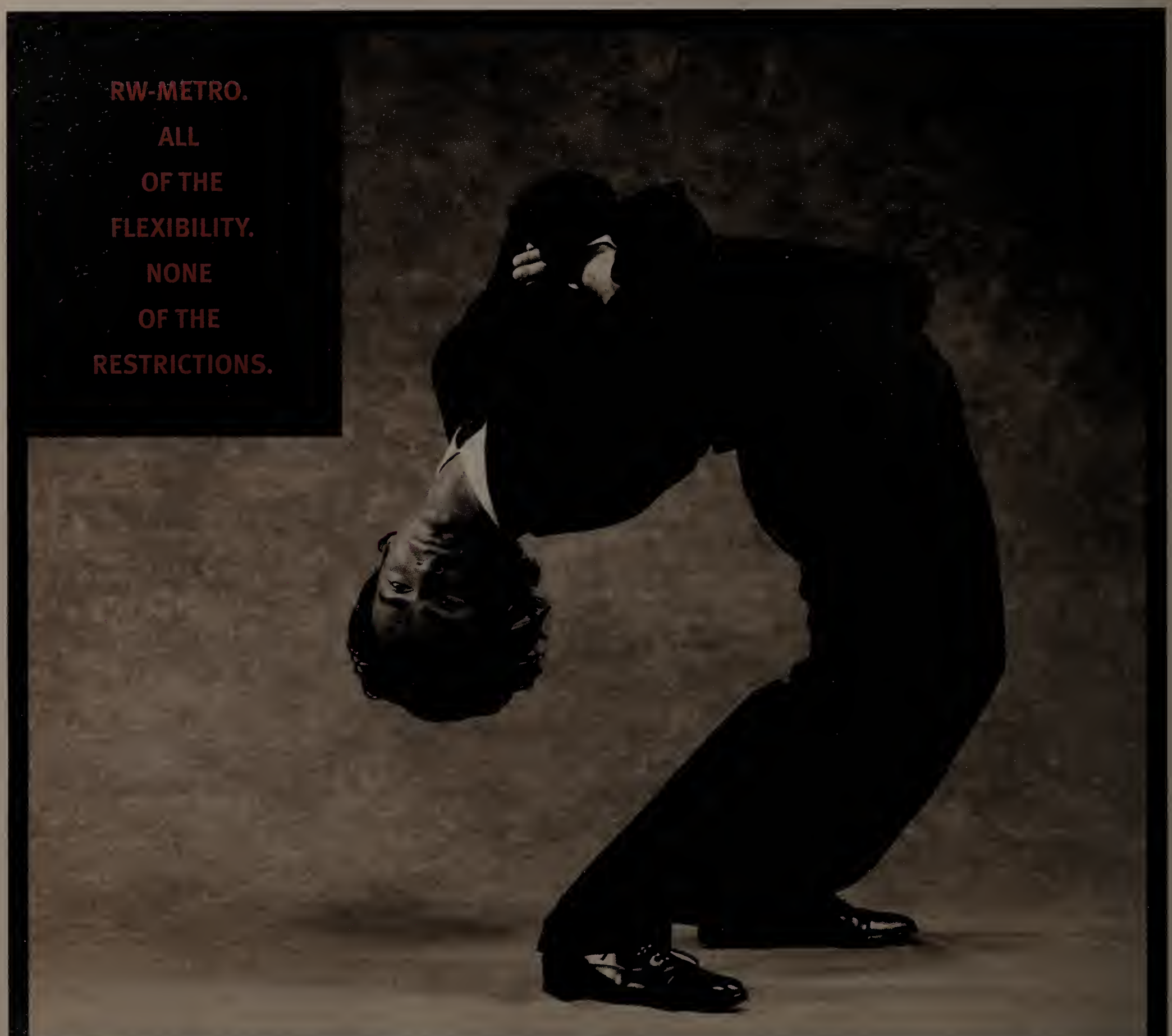
COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for immediate verification.



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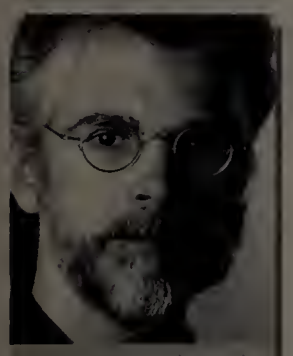
WILLIAM ULRICH

Domino effect is key to predicting Y2K impact

HOW BAD WILL the year 2000 problem be? Corporations and governments are asking this question with increasing frequency. Most predictions focus on the immediate effects of computer failures. But predicting how the year 2000 problem affects corporate America requires an analysis of the domino effect that cascading failures might have over a period of time. Year 2000 problems have been occurring for years and will run well into the next century, but the greatest impacts could manifest themselves in the latter part of 2000 — even assuming that domestic power, water and telecommunications systems will continue to function well into the year 2000 (I assume the situation outside the U.S. will be more problematic).



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To predict year 2000 failures, you have to start with problems reported to date. For example, half of the companies in a Cap Gemini survey had already reported year 2000 errors by late 1998. Although look-ahead routines, "99" logic and remediation errors will escalate this year, they're unlikely to cause major revenue shortfalls that you can't correct quickly. But when 2000 arrives, the game changes dramatically. In 2000, systems will encounter backward-looking calculation, date-routine, input validation and remediation errors. Old date routines, shared by hundreds of programs, could fail en masse. These problems could easily outrun or slip by the watchful eyes of repair teams. As these events unfold in IT, end-user and embedded systems, companies could encounter a domino pattern of failures.

Data corruption is an insidious problem that's hard to find and hard to fix. Transportation delays linked to routing, port management, refueling and onboard system errors also may take hold. Manufacturing glitches, supply-chain interruptions, import/export delays and late payments could drag production, trade and the economy down further. Even if you assume that these issues will be addressed domestically, foreign impacts still could result in major problems in the second quarter of 2000. In Asia, questioning a supplier's ability to deliver results in a loss of face — which limits the reliable information you can get on that part of the supply chain. This will exacerbate year 2000 problems in the Far East.

Many oil-producing nations, according to a recent Gartner Group survey, fall into high-risk failure categories. As many as half the companies in these nations will experience critical failures. Energy production and distribution delays could strike the U.S. in the second or third quarter of 2000, when reserves run low. In addition to this, infrastructure problems in Latin America, Russia, China, Africa and Eastern Europe could delay production and revenues at U.S.-based conglomerates. When you see these problems collectively, the year 2000 problem begins to look more like a year 2001 economic headache.

How should you prepare for these delayed impacts? Executives can't let their guard down if only limited year 2000 failures materialize in early 2000. Contingency and crisis management teams must stay alert throughout the year — especially if their companies have significant international dependencies. The biggest challenge requires managing a company through an economic downturn, eliminating economic anchors, shifting production and distribution channels and jumping on competitive opportunities where possible. Finally, remember that these considerations assume an *optimistic* scenario. ◗

GALEN GRUMAN

E-commerce blurs lines of integrity, but they still exist

IT DIDN'T TAKE much to get Amazon.com to back off its plan to charge book publishers for special editorial attention — just a recent front-page exposé in *The New York Times*. Many of Amazon.com's customers were horrified, thinking that the ostensibly independent staff recommendations on books may have in fact been disguised paid advertising. For its customers, one of Amazon.com's virtues is its sense of community, a virtual meeting place for book lovers to trade opinions and learn about books — much like the café/leisurely browsing strategy adopted by the major brick-and-mortar booksellers in an attempt to capture the personal feel of old-time bookstores in an era of megachains. But as soon as those opinions seemed to be up for sale, the whole proposition was threatened. Suddenly, Amazon.com seemed to be no more than a marketing catalog. And so customers had no reason to be loyal to the online bookseller. Even if customers thought the others were no better than an apparently untrustworthy Amazon.com, anger about being deceived could still drive them to alternatives. It didn't matter that Amazon.com officials said the plan wouldn't affect the staff's recommendations. The seeds of doubt had begun to sprout, making anything Amazon.com officials said questionable.

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Amazon.com isn't the first company to run up against that thorny issue. Consumers are used to being bombarded with ads and marketing pitches. That's why review-oriented publications have such power — they are usually the independent place for consumers to turn to for buying advice. When I was executive editor at *Macworld*, company after company told me how many hundreds of thousands — even millions — of dollars in revenue our product reviews could add — or deny.

So it's natural that companies seek to add editorial content to their operations. People trust it. That's why bookstores offer staff recommendations, hospitals and medical chains run feel-good advice ads on television, online computer stores provide generic how-to-decide stories and so many financial and real estate firms pump out informational newsletters.

But that strategy works only if customers believe the information to be independent.

Sure, you can fool buyers for a while. Indeed, some search engines have successfully sold their top results for specific searches, so you get a skewed response based on who paid to get in your face if you have certain interests. But wait till consumers realize that and stop trusting a major search engine or two.

Look at the questions that Walt Disney Co. has faced since acquiring the ABC and ESPN networks. The entertainment programs with thinly disguised Disney World ads are merely annoying, but when ABC News gets questioned — as it has been — on whether it now pulls punches in its reporting, that causes long-term damage to its core value proposition. The Microsoft/NBC alliance that created the MSNBC cable channel and Web site raised similar concerns about its technology coverage and programming.

In the online world, it's harder to see such disguises. Who would know if an online travel agency was skewing price results based on airlines that paid it for the privilege? Or if a financial advice site was skewing its recommendations for sponsors? Or a news site was running product news based on who advertised?

Successful print publishers have long had to grapple with such editorial integrity issues, and they have a set of accepted standards to reinforce them. That's why editorial-looking ads have disclaimers on them and why most publishers separate ads from editorial content mentioning them.

Still, not all publishers follow these standards. And on the Web, where the visual difference between an ad and independent editorial content is often nearly nonexistent, it's even easier to use fake editorial content to fool your customers.

Tempted? Just remember that short-term approach is likely to kill your brand and good name. And your competitors will still be there. ◗

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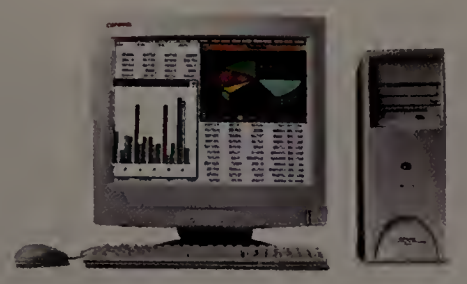

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BUSINESS

MERCHANDISE ON THE MOVE

A data warehouse application at Mervyn's department stores marks down aging merchandise scientifically, clearing shelves on schedule 90% of the time. Parent company Dayton Hudson is adopting it nationwide as a way to keep its operations lean. ▸ 42

VYING FOR EYEBALLS

Gaming sites are among the "stickiest" out there. One, Gamesville, keeps users so glued that they wait through commercials in the middle of a game. It has ad response rates of up to 22%. ▸ 45

LOSING THE CONTRACT

Some users are fighting desperately to prevent changes to the rules of software contracts so favorable to vendors that customers wouldn't stand a chance. How bad is it? Just kill the whole process, some say. ▸ 52

NEGOTIATING FOR MCDONALD'S

Dave Weidenfeld has the final legal word on McDonald's IT contracts; the job has made him a sharp negotiator. Read his tips for winning at the bargaining table. ▸ 50

BEST INDUSTRIES

Banking and insurance are hot areas for IT skills because information is a central part of the business. But building and construction? Sure. Both are among the 10 best industries for IT, which is playing an ever-greater role. ▸ 55

CEOS ARE ROSY ON Y2K . . .

A new survey of CEOs shows they're a lot more confident than CIOs on year 2000 issues. CIOs see problems and ask for resources; CEOs stick with rosy misconceptions to keep confidence high. ▸ 43

. . . AIRLINES, TOO

There's a huge disparity in the amount airlines say they will spend on year 2000, but dollar figures have more to do with accounting than computer science. ▸ 43

TEACHERS NEEDED

Web-based training doesn't always pass the test. Besides technical problems, interpersonal issues crop up, too. Many users find that a mix of in-person and virtual training works best. ▸ 44

CAREER SITES

Shopping for the best sites to help keep your training up-to-date? Here are *Computerworld*'s picks of the best and second best. ▸ 49

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MANUFACTURING SYSTEMS HONCHO Thomas Gottfried says sophisticated production-planning capabilities will help Moore Corp. recoup its supply-chain management investment in less than a year

BLAIR JENSEN

USERS LEAPFROG ERP ROLLOUTS

MOST USERS WHO want to get their supply chains under control roll out ERP systems first, even if the process takes years. But some are finding that a nimble supply chain provides enough advantage to be worth the pain of plugging supply-chain management tools directly into a mish-mash of mainframe applications.

47

Application Keeps Merchandise Moving

Clearing sales floor offers retail advantage

BY DAVID ORENSTEIN

There's still no accounting for taste, but a sophisticated application gives Dayton Hudson Corp. a way to minimize the impact of bad bets on what consumers want.

The application moves goods out of stores efficiently by making store-by-store price markdown decisions on products that have passed their peak selling periods. The prices, which are based on several years of data, clear unpopular merchandise from the sales floor, making room for newer, higher-margin items.

Paul Lamoureux, a business consultant who was a lead architect of the application at Mervyn's California, the Dayton Hudson department-store chain that developed it, said the system can move merchandise within a prescribed time frame more than 90% of the time. Traditionally, merchandisers meet the desired timetable only about 75% of the time.

Some other major chains, such as TJX Cos. in Framingham, Mass., Sears Roebuck and Co. in Hoffman Estates, Ill., and Wal-Mart Stores Inc. in Bentonville, Ark., also are working on systems to bring some science to clearance markdowns, analysts said. But, with few exceptions, retailers still depend on human merchandisers to make the markdown decisions, said Brian Hume, president of Martec International Inc., an Atlanta-based retail consultancy.

Merchandisers often have an emotional stake in the items they have brought into the chain and can be reluctant to mark them down far enough, Lamoureux said. "It's a tough thing to say 'your baby is ugly,' " he said. The unfeeling application, however, has proved that the steepest markdown should be taken early to ensure that the merchandise leaves the store while it still has some appeal. It avoids the tendency of human merchandisers to make only small markdowns to stay within a prescribed amount of how much the retailer is willing to sacrifice to get the merchandise out the door, Lamoreux said. But the system also uses data on sales at the full price to calculate when a smaller discount would be enough to spark sales, keeping losses to a minimum.

Much of the application's models and intelligence were developed by the Retail Management Institute (RMI) at Santa Clara University in California, Lamoreux said. With the school's help, development took about six months. The models are available to retailers who participate in the university's Retail Workbench project. The database tracks not only sales but also inventory levels and the frequency, date, and placement of ads and promotions.

MERVYN'S CALIFORNIA stores are now better at moving merchandise before it loses its appeal

All of the data is specific to each of Mervyn's 269 stores. Determining markdowns on a store-by-store basis is essential to maximizing profits, said Dale Achabal, director of the RMI. Some items sell better at some stores. To give an unnecessarily large discount would cost a chain dearly.

Sears also used Santa Clara's markdown model as the basis for a smaller-scale application that's in the pilot stage in selected Sears' departments and will be rolled out across the chain in the next two years, said Rhys Rankin, a manager in Sears' retail inventory management unit. The application works on a store-by-store basis but uses five weeks of data rather than two to three years.

Mervyn's has used its application for several years, but this year it became mandatory across all Dayton Hudson stores. "It does give you a competitive advantage," Lamoureux said. ◗

BANK SYSTEM KEEPS HEAVY-HITTERS HAPPY

Customer relationship management tailors info delivery to client

BY THOMAS HOFFMAN

CORPORATIONS that generate $500 million or more in annual sales generally are the kind of customers you want to keep.

That's particularly true on the cash-management side of banking, where players such as The Chase Manhattan Bank Corp. and Banc One Corp. handle large dollar transfers and other transactions for corporate customers.

Banks compete very aggressively to lure clients with attractive pricing and special cash-management services, said Raphael Soifer, a banking analyst at Brown Brothers Harriman & Co., an investment bank in New York.

To help differentiate itself in that market, BankAmerica Corp. is pilot-testing a customer relationship management (CRM) system from Diffusion Inc. in Mountain View, Calif., that can help banks keep in touch with clients by E-mail, voice mail, fax or pager.

BANKAMERICA'S Rick Leander: System answers customers' call for flexibility

Banks typically notify big customers about events such as incoming or outgoing wire transfers, investments that has matured or changes in foreign exchange rates. But most do it using a single channel such as Internet E-mail, fax or voice mail. BankAmerica's customers asked for greater flexibility in the way they were notified, said Rick Leander, a senior vice president at the Charlotte, N.C.-based bank. "The idea here is to determine for customers what pieces of information are critical to them and what channel they want to receive it through," Leander said.

BankAmerica looked at a handful of CRM systems about 15 months ago. But most packages offered strictly Web-based information distribution, such as E-mail notification. "Our view is that the Web is important, but it isn't the only [communications] mechanism," Leander said.

In the first phase of the pilot, BankAmerica used the Diffusion system to page clients whenever the bank was about to process big checks to make sure that the checks weren't fraudulently obtained and to ensure that the customer wanted the bank to process the transactions. It used to notify customers of such events via E-mail. BankAmerica expects to complete the pilot by the end of next month and then begin rolling out the system.

The seven-figure investment in software and Unix servers was a no-brainer, Leander said, because the system should "pay for itself quickly" by generating new business with existing clients while helping to lure new customers.

The benefits of using CRM systems in banking often are "intangible and difficult to measure," said Octavio Marenzi, research director at Meridien Research Inc. in Newton, Mass. BankAmerica competitor Wells Fargo & Co. is one bank that successfully tracks all levels of customer activity using CRM systems to offer services based on their profiles or activities, he said. ◗

SNAPSHOT

More Money for IT

Average IT budget as a percentage of company revenue, 1996-1998, worldwide:

1996	5.1%
1997	6.9%
1998	7.1%

Average IT budget as a percentage of company revenue, by country, 1998:

Australia	3.3%
U.S.	6.4%
Canada	6.6%
Sweden	11.5%
U.K.	16.3%
China	20%

Base: Interviews with 426 worldwide companies, November 1998

SOURCE CUTTER INFORMATION CORP., ARLINGTON, MASS.

CEOs, CIOs SPLIT ON Y2K READINESS QUESTION

Execs downplay business disruptions; IT sees technical glitches

BY THOMAS HOFFMAN

ASK THEM how prepared their organizations are to deal with the year 2000 problem, and most CEOs exude confidence.

Pose the same question to CIOs, and you will receive a decidedly more bearish response.

Why the disparity?

Executives and analysts cite several reasons. In general terms, CEOs largely view the millennium bug purely in business terms. As such, they "believe they have the issue under control in terms of risk management," said Lynn Edelson, a Los Angeles-based consultant at PricewaterhouseCoopers, which recently surveyed 850 CEOs in 19 countries around the world.

Of the CEOs polled, 94% said their organizations are "completely" or "mostly" prepared to deal with information technology issues related to the year 2000 problem.

Under Control?

How ready do CEOs think their companies are for year 2000?

Completely prepared	32%
Mostly prepared	62%
Mostly unprepared	5%
Completely unprepared	1%

Base: 850 CEOs in 19 countries.

SOURCE: PRICEWATERHOUSECOOPERS, NEW YORK

Blinders On

At least one analyst found fault with those perceptions. "CEOs have a big misconception about the year 2000 status in their companies. They don't understand the full scope of the technical or business issues," said Stephanie Moore, an analyst at Giga Information Group Inc. in Cambridge, Mass.

Meanwhile, most CIOs are less optimistic about their organizations' readiness because they're closer to what must be done to mitigate the risks. "No CIOs expect there won't be any problems," said John C. Hodge, CIO at NAC Reinsurance Corp. in Greenwich, Conn.

RICK BROWN: CEOs and CIOs disagree because they have different goals

Instead, Hodge said, CIOs are asking themselves questions such as: "Will I have enough people to work on these problems when they occur next year?"

Culture may also help explain the rift. For example, even in blind polls, CEOs are conditioned against commenting negatively on events that could disrupt their businesses and lower customer and shareholder confidence.

Disparate objectives also come into play. "A CEO will benefit from a rosy perspective [on year 2000] because he does not want the stock prices to fall. A CIO hopes for a bigger budget. So in both cases, they stand to gain from what they have or have not said," said Rick Brown, a Lynnwood, Wash.-based freelance programmer who is working on his fourth year 2000 project for an aerospace company in the Pacific Northwest.

Howard Rubin, a research fellow at Meta Group Inc. in Stamford, Conn., has been tracking the problem closely. He said, "Why [should CEOs] panic [investors and customers] when the year 2000 is still 10 months away?" ◗

At Airlines, Big Spenders Aren't Always Best Prepared

Accounting blamed for spending gap

BY STACY COLLETT

With all airlines facing similar reservation, baggage, safety and back-office issues, can a bigger year 2000 budget mean a better outcome? Not necessarily, according to some industry watchers. The year 2000 cost estimates of U.S. airlines vary widely:

- Delta Air Lines in Atlanta, the third-largest U.S. carrier on a revenue basis, put its year 2000 costs at up to $175 million.
- AMR Corp.'s American Airlines in Dallas, the No. 2 carrier, reported that it will spend $160 million on year 2000 compliance.
- UAL Corp.'s United Air Lines in Chicago, the No. 1 carrier in the country, said it plans to spend just $70 million on year 2000 issues.

The discrepancy can be attributed to how each airline organizes its year 2000 program office, said Tom Browne, director of the year 2000 program at the Air Transport Association, an airline trade association in Washington.

For example, AMR "is organized in a big central program office ... and can analyze down to the last cent how much has been spent," he said, but "United has farmed a lot of work out to the relevant experts within the company. [Thus,] a lot of [year 2000 expenditures] are reported as routine maintenance."

While Browne chalked up the variations to organizational differences, others said it's all politics.

"If you have a tight budget, and you can finally get that favored software package that everyone's been denying you, you would just call it a year 2000 expense," said Paul A. Strassmann, an independent technology consultant in New Canaan, Conn., and a *Computerworld* columnist.

American, United and Delta wouldn't comment on their year 2000 software purchases. But their spokesmen said they are well on their way to achieving year 2000 compliance by midyear.

The airline industry survived its first year 2000 test on Feb. 4 when it began taking passengers' reservations for travel in 2000. Now the airlines' attention turns to safety issues and major "convenience" items, such as baggage systems, Browne said.

United has completed 90% of its year 2000 work on critical computer systems, according to a company statement. Some 40,000 computer programs have been checked, and about 11,000 required year 2000 corrections. The airline is scheduled to complete testing by March 31.

American deployed more than 1,000 programmers to correct thousands of software applications and hardware items, according to a statement. The airline now says all its information technology systems are year 2000-ready. By July 31, American expects to have all infrastructure, hardware and third-party products compliant as well.

Delta provided no details on where its year 2000 plans stand. ◗

How Ready Are They?

BY THOMAS HOFFMAN

Here's a look at what two public companies, International Paper and Clorox, revealed about their year 2000 plans in 10-Q reports filed with the Securities and Exchange Commission Dec. 31 and released last week:

International Paper Co., Purchase, N.Y.
1998 revenue: $19.5 billion
Year 2000 costs: $135 million, plus or minus 30%
Risks: Production facilities have the greatest risk of disruption; shutdowns could adversely affect the company.
Remediation: About 55% of centrally controlled administrative applications have been repaired.

The Clorox Co., Oakland, Calif.
1998 revenue: $2.74 billion
Year 2000 costs: $30.8 million
Embedded systems: Expects to complete its plant floor assessment and remediation plans by Sept. 30.
Worst-case scenario: A regional utility failure that would interrupt manufacturing operations and distribution centers in the affected area. ◗

SNAPSHOT

Competitor Comparison

What the nation's top two supermarket chains say about their year 2000 work:

	KROGER CO.	SAFEWAY INC.
Fortune 500 rank*	36	50
Spending through third quarter of 1998	$10.7M**	$13M**
Estimate of total Y2K cost	$32.1M	$25M

* As of April 27, 1998 ** [illegible] Oct 3

SOURCE: COMPANIES' LATEST 10-Q FILINGS WITH SECURITIES AND EXCHANGE COMMISSION

Web Training Requires Different Educational Approach

Units should be shorter, may still need classroom time

BY BARB COLE-GOMOLSKI

Web-based training may be an inexpensive way to get end users up to speed, but it also means taking a different approach to course development — and often must still be supplemented by teacher-led sessions or other media.

Some companies have cut their training budgets by up to 75% by replacing classroom training with Web courses. As a result, the use of Web-based training is on the rise, particularly when large numbers of users need to be trained quickly [CW, Feb. 8].

"There's a big misconception that you can take your instructor-led training courses, drop them into a Web-based training system and push that out to end users," said Dean Brown, vice president at D A Consulting Group Inc., a Houston firm that specializes in training systems for enterprise resource planning. That's not the case, he said.

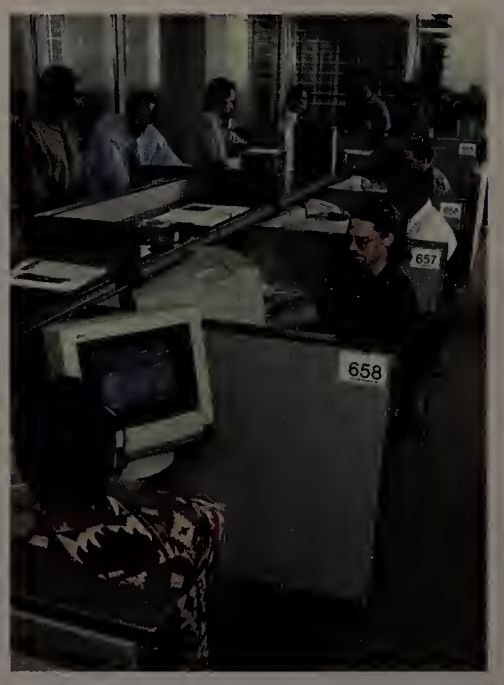
First, although instructor-led classes may last a day or longer, students usually can't handle more than a one or two hours of Web-training at a time, Brown said.

And companies that train users in multiple countries have to deal with language differences and cultural idiosyncrasies. "If you are training users in North America and Asia, chances are you will have to present that information differently in a Web course," Brown said.

Technical Difficulties

There also can be technical challenges to Web-based training. Not all companies have TCP/IP to the desktop, and the pictures and sounds of training programs can bog down networks.

Bandwidth was a big concern at Corning Inc. in Corning, N.Y., which uses Web-based training to educate users on PeopleSoft Inc. software. The company was able to deploy the training courses without eating up excess bandwidth by selecting a training tool that stores course components at the server and streams them to the desktop on the fly, according to training coordinator Maureen Smith.



COMPANIES OFTEN CHOOSE media training when workers need to be taught quickly

As a result of those challenges, some companies continue to use classroom and CD-ROM training even after deploying a Web-based training system.

That was the case at Convergys Corp., a customer service outsourcing company in Cincinnati.

Even though it planned to use Web-based training to get its telephone representatives up to speed on software from SAP AG, Convergys first rolled out some CD-ROM training courses to get people familiar with the general flow of application screens.

"Next, we brought people into the classroom to give them some instruction on basic navigation [of the software]," instructional analyst Peter Richards said. Finally, the company rolled out its Web-based training, which included a detailed help system and application simulations.

E-COMMERCE

VITAMINS ANOTHER BURGEONING NICHE

Drugstores join specialty retailers in online venue

BY SHARON MACHLIS

AFTER LESS than a year online, The Vitamin Shoppe Inc. said last week that 10% of its catalog sales now come from its Web site and it expects $20 million in sales there this year. The site was launched in April.

It's a sign, analysts said, of an emerging online market for vitamins and other dietary supplements, which were an estimated $12 billion business in the U.S. last year and make up one of the more profitable sectors of the pharmaceutical business.

"It's a potentially huge market," said Ken Cassar, an analyst at Jupiter Communications Inc. in New York.

Only a few players, such as MotherNature.com Inc., GreenTree Nutrition Inc. and The Vitamin Shoppe, focus on selling nonprescription dietary supplements on the Net. But the space is likely to get a lot more crowded this year.

Well-financed newcomers such as Drugstore.com in Redmond, Wash., and PlanetRx Inc. in South San Francisco, Calif., have said they will open general drugstores on the Internet.

And, market giant General Nutrition Cos. in Pittsburgh launched a Web site last month to supplement the $1.2 billion in sales it did last year. For now, *www.gnc.com* is an unadvertised early foray into electronic commerce. But in October, GNC plans to launch a major nutrition, pharmacy and shopping site *(www.gnc.riteaid.com)* with drugstore chain Rite Aid Corp.

"It's not going to be a cheap business to be in," Cassar said, because the competition will send advertising and marketing budgets soaring. GreenTree, which focuses on dietary supplements, also plans to expand into other drugstore goods, CEO Don Kendall said.

Those now selling vitamins on the Web say customers are looking for information about nutrition and health as much as they're seeking products.

"They don't want to point and click and buy. They want to learn a little bit," said Vitamin Shoppe founder and president Jeff Howard. In December, Vitamin Shoppe set up a separate site called Vitaminbuzz to help answer customer questions. GreenTree has health and nutrition information directly on its site.

Howard said most VitaminShoppe.com customers are new to the company, so online sales aren't cannibalizing mail-order and store purchases.

Vitamin Shoppe said it expects a small loss for its Web site this year and a profit in 2000, Howard said.

'E-MERCIALS' A NEW ONLINE AD OPTION

Game site delivers captive audience for full-screen messages

BY JEANETTE BORZO

AN ONLINE GAMING site called Gamesville.com has begun to air personalized, full-screen "E-mercials," presenting a new twist in the current palette of online advertising options.

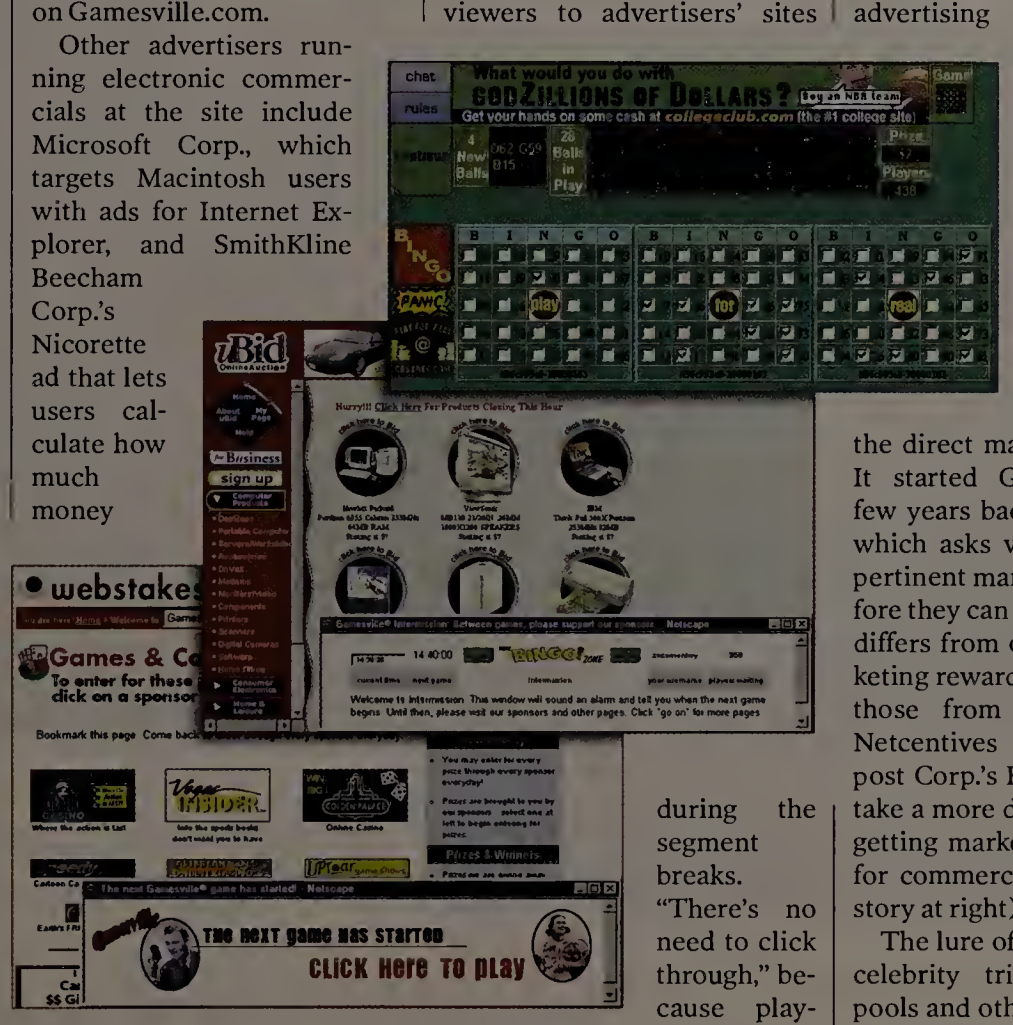
The electronic commercials at the site, operated by Boston-based NineCo Inc., run at full-screen size between regularly scheduled games, so there's no way for users to navigate around the ads. All of the site's nine games, such as AceyDuecy and Crystal Ball, are synchronized to run in the same eight-minute segments around-the-clock, with two-minute electronic commercials separating them.

"They make it a captive experience," said Seema Williams, an analyst at Forrester Research Inc. in Cambridge, Mass. "Often you can ignore or skip past a banner while it's running. But the commercial break is too short to do anything else, so the consumer sits there."

Other capabilities of the NineCo electronic commercials are interactivity and their ability to target viewers by demographics.

"They have taken Web advertising to the next level — the full-screen format lets an advertiser do much more," said Stuart Bogaty, marketing director at New York-based Cone Interactive, which has placed ads for *Rolling Stone* magazine on Gamesville.com.

Other advertisers running electronic commercials at the site include Microsoft Corp., which targets Macintosh users with ads for Internet Explorer, and SmithKline Beecham Corp.'s Nicorette ad that lets users calculate how much money they spend on cigarettes each year to see what they would save by quitting.



AT GAMESVILLE'S BINGO SITE, after viewers finish playing bingo (top), the site sends them to an advertiser's site with a pop-up window that warns them when the next game will start (middle and bottom)

But advertisers don't have to develop an electronic commercial to appear on the site. Gamesville.com can "deliver" viewers to advertisers' sites during the segment breaks. "There's no need to click through," because players are automatically delivered to the advertiser's site, Williams said. Users then are notified when the next round of games is about to start. For its part, NineCo claims viewer response rates to electronic commercials that far surpass the average click-throughs on banner ads.

"We're logging 6% to 22% response rates — this is a gargantuan home run in terms of Web advertising banners," said Mark Herrmann, NineCo's sales and marketing director, given that banner ads traditionally have a response rate of less than 1%.

NineCo took a somewhat indirect route into the direct marketing business. It started Gamesville.com a few years back as a game site, which asks viewers for a few pertinent marketing details before they can play. The strategy differs from other online marketing reward schemes such as those from Cybergold Inc., Netcentives Inc. and Intellipost Corp.'s BonusMail, which take a more direct approach to getting marketing information for commercial purposes (see story at right).

The lure of gaming — bingo, celebrity trivia, NFL office pools and other games that net winners anywhere from $1 to $1,000 — has won Gamesville.com marketing profiles on 1.2 million players and a spot atop Media Metrix's list of sites with longest visits for December (average of 246 minutes).

But a site doesn't necessarily have to be a gaming site to use some of Gamesville.com's tactics to attract users and their marketing data. "If you're not a game site, you can put your own game up like a stock market simulation for online trading wanna-bes," Williams said. "Think about the sports environment — there are games that translate into other content environments. Using games, you can make your content more interesting, engage the audience and make the consumers give up their information." ◗

Borzo writes for the IDG News Service in Paris.

Helping Sites Collect Data

Most businesses and advertisers don't have a former rocket scientist on staff (as NineCo does) to write an online gaming engine that supports thousands of simultaneous users. But the following are ways they can lure users to build and expand their customer databases:

■ Companies can offer site visitors a free gift but require them to register in order to receive it. Del Laboratories Inc.'s Sally Hansen Web site, for example, offers visitors the "Sally Hansen Electronic Calendar and Nail Treatment Guide." When consumers click on the gift box on the Sally Hansen home page, they're prompted to take a short survey and provide their name, address and so on. Then they can download the electronic calendar, which appears as a branded icon on the customer's desktop. It was developed by InternetPerks Inc. *(www.internetperks.com).*

■ Companies can pay users for looking at an ad and charge advertisers a commission each time a user checks one out, as Cybergold Inc. does *(www.cybergold.com).* Advertisers set up what is essentially a debit account; once consumers interact with an ad, they click on a gold coin to make a withdrawal, which goes into their Visa credit-card or bank accounts.

■ Reward users for filling out a profile (which lets advertisers send them targeted E-mail) with merchandise points. That's what Intellipost Corp.'s BonusMail does *(www.bonusmail.com).* It gives members points – exchangeable for frequent-flier miles, books and other items – every time they read one of the E-mail messages.

Here's how it works: Each message contains a "MagicWord," and users reply to the message with the MagicWord in the subject field to receive their credit.

■ Try luring customers with frequent traveler points. Netcentives Inc.'s ClickRewards program gives customers ClickMiles, redeemable at online stores and at frequent traveler programs in exchange for completing an activity usually related to a specific marketing objective.

■ Offer a sweepstakes. Yoyodyne Entertainment Inc. *(www.yoyo.com),* acquired by Yahoo Inc. in October, specializes in providing online games and sweepstakes that let advertising clients extract marketing data from participating consumers. ◗

BRIEFS

Mortgage Update

Countrywide Home Loans Inc., a major home mortgage lender based in Calabasas, Calif., has chosen the E-Test suite from RSW Software Inc. in Watertown, Mass., to help in the deployment of new Web-based applications.

Countrywide will use the software to monitor both internal online tasks as well as new capabilities for outside customers. Terms of the contract weren't disclosed.

Web Merchant Challenges

International Data Corp. is offering a report titled "The Web Sellers Speak: Learning from the Leaders," which is based on a phone survey of 100 online commerce companies.

According to the Framingham, Mass., research firm, the report examines the challenges of online commerce and what Web merchants are doing to mitigate problems. It documents successful online strategies, emerging technology implementations and lessons learned.

The report costs $4,000.

Integration Information

Greenwich, Conn.-based consultancy NASG Inc. has launched a commercial Web site that provides news, analysis and other information regarding enterprise application integration products. The site is *www.messageq.com.*

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SOME USERS DELAY ERP, AIM AT SUPPLY-CHAIN

Logistics planning tools sometimes deliver quicker payoff than ERP installations

BY CRAIG STEDMAN

MOST COMPANIES that want to run their businesses more efficiently start with an enterprise resource planning (ERP) system and then move on to supply-chain planning software. But some are breaking that mold to quickly get at the lower inventory costs, labor savings and other benefits promised by supply-chain tools.

They've been plugging supply-chain software directly into their mainframe systems, which pass along customer orders and the other business transaction data that the planning tools need to do jobs such as demand forecasting, production scheduling and inventory replenishment.

But several users warned that connecting supply-chain packages to a series of standalone mainframe applications is much more daunting and costly than links to an integrated ERP suite would be.

For example, Brunswick Corp.'s Mercury Marine division in Fond du Lac, Wis., "had to be creative" to pull in data from its eight international offices and distribution centers, said Bruce Abraham, director of logistics planning and international distribution at the unit. Most weren't even tied to its central systems, so the company spent three months setting up a way to get the information to the mainframe via dial-up file transfers.

And building the required interfaces between the mainframe applications and planning software from Atlanta-based Logility Inc. took even more time.

"In a lot of cases, the [mainframe] systems were written a long time ago, and finding documentation or people who knew about them wasn't easy," Abraham said.

But the planning tools helped Mercury cut inventory of unsold boat motors by 53% when the last model year ended in mid-1998, compared with the year-earlier total of leftovers. Monthly demand forecasts also are more realistic and can be prepared much faster, Abraham said. And the unit still doesn't have a full ERP system in place.

Careful Steps

Moore Corp., a Lake Forest, Ill., maker of printed business forms and other products, is doing supply-chain planning before rolling out SAP AG's R/3 ERP system in its U.S. plants. The company began to use Atlanta-based SynQuest Inc.'s planning tools at two sites in December and plans to add five more plants by summer.

Moore wanted to quickly start doing more sophisticated production planning to cut costs and improve its ability to tell customers when their orders will be ready.

BLAIR JENSEN

MOORE'S THOMAS GOTTFRIED: "We buy in to the idea that the return on investment is much greater [with supply-chain software] than it is on an ERP system"

"We buy in to the idea that the return on investment is much greater [with supply-chain software] than it is on an ERP system," said Thomas Gottfried, project director for manufacturing execution systems at Moore. The company expects payback from the SynQuest software in less than a year, he said.

But Moore is building only a one-way interface to feed orders and materials data from its mainframe applications to the SynQuest software, Gottfried said. For now, information is being sent back to the financial system on the mainframe manually.

The one-way mainframe connection "was very simple, and that was one of the reasons we were able to sell this" internally, Gottfried said. The additional development cost of a two-way interface was too high to justify with the R/3 rollout due to start this year, he added.

ERP Remains Strong

Most users still go the ERP route before turning their attention to supply-chain planning. Forrester Research Inc. in Cambridge, Mass., estimated that ERP systems outnumber installations of planning tools by a 5-to-1 ratio, though the population of users to whom they appeal is nearly the same.

R/3 and other ERP suites provide common data formats and high-level application programming interfaces that help reduce the complexities of supply-chain integration, said Joshua Greenbaum, an independent analyst in Berkeley, Calif. But many users "are still up to their elbows [finishing] ERP installations," he added.

For example, Valero Energy Corp. plans to finish an R/3 rollout before adding SAP's new advanced planning software late this year or in early 2000, said Hal Zesch, SAP coordinator at the San Antonio-based petroleum refiner.

Connecting supply-chain tools to Valero's old mainframe systems "would have been impossible," Zesch said. The more sophisticated distribution scheduling that Valero has in mind requires reams of data that previously was spread across incompatible applications at four refineries, he said.

Not Waiting on R/3

But VF Corp., a clothing maker in Greensboro, N.C., is going ahead and integrating I2 Technologies Inc.'s planning applications to mainframe systems at several of its divisions before going live with R/3.

Leroy Allen, vice president of re-engineering at VF, said R/3 eventually will replace its mishmash of mainframe programs. But that project was held up when SAP was slow with add-on software for apparel and footwear companies.

Even without the help of an ERP system at first, VF projects that the applications from Irving, Texas-based I2 will produce savings such as a 15% reduction in inventories and more efficient scheduling of workers in its plants, Allen said. But writing 100-plus mainframe interfaces was "very tough," he added.

"Getting good, clean data out of our legacy systems is an issue in every one of our divisions," Allen said. "We're having to do a lot of data cleansing, or else [the mainframe systems] just don't have all the information, and we have to figure out how to get it." ◗

ERP: Nothing's Ever Simple

To make it even easier to integrate their planning tools with ERP systems, supply-chain vendors such as I2 Technologies and Manugistics Inc. in Rockville, Md., are releasing prebuilt links to R/3 and rival applications.

But users still have to do some customization of the interfaces to fit their business needs. And supply-chain analysts cautioned that ERP systems often overwhelm planning tools with raw transaction data.

For example, the supply-chain software may need to know only about new orders or orders that have changed since the last data feed. But the general-purpose application programming interfaces in ERP systems weren't designed to filter transactions, said Steven Cole, an analyst at Forrester Research.

As a result, users "sometimes have to grab much more data than they really need," Cole said. "Data extractions can take hours."

Karen Peterson, an analyst at Gartner Group Inc. in Stamford, Conn., said she has seen cases in which it took as long as 18 hours for an ERP system to feed data to a planning tool.

– *Craig Stedman*

Head-to-Head Comparison

	ERP SOFTWARE	SUPPLY-CHAIN SOFTWARE
Rollout time	18 months or more	9 months
Payback period	2.5 years	9 to 12 months
Number of users affected	Hundreds to thousands	10 to 40
Value to end users	Medium	High

SOURCE: GARTNER GROUP INC., STAMFORD, CONN.

Airline Customers Use E-mail as Soundboard During Crisis

BY ROBERTA FUSARO

Thousands of stranded travelers can generate a lot of E-mail and Web hits, even if they don't expect the airline to solve their immediate problems via E-mail.

At least that was the case for about 450,000 passengers who were caught in the middle of the recent American Airlines pilot sick-out.

A spokesman at American said since the sick-out started Feb. 8, the airline's Web site has received hundreds of thousands of unique hits per day — a 40% increase at the peak of the crisis from normal levels. Customers were seeking real-time information about flight cancellations and refunds, he said.

E-mail was up, but most messages were "opinion" postings from passengers lashing out at the pilots. "I don't think our customers view E-mail as a method for solving [short-term] problems," said Tim Smith, an American Airlines spokesman.

He declined to say how the company handles incoming E-mail but said American revamped its Web site last summer and had no problems handling the increased traffic.

Northwest Airlines faced a similar crisis when its pilots went on strike last September for almost two weeks. But the airline used an automated E-mail response system to send canned responses and updates to travelers grumpy about having their travel plans upended.

Paul Long, analyst for online distribution at Northwest, said the strike prompted a 30% increase in E-mail and a 10% boost in page views at its Web site. But he said the company wasn't bowled over by the increased volume of E-mail. In fact, it has realized a 50% increase in productivity (measured in number of E-mails answered per day compared with previous numbers).

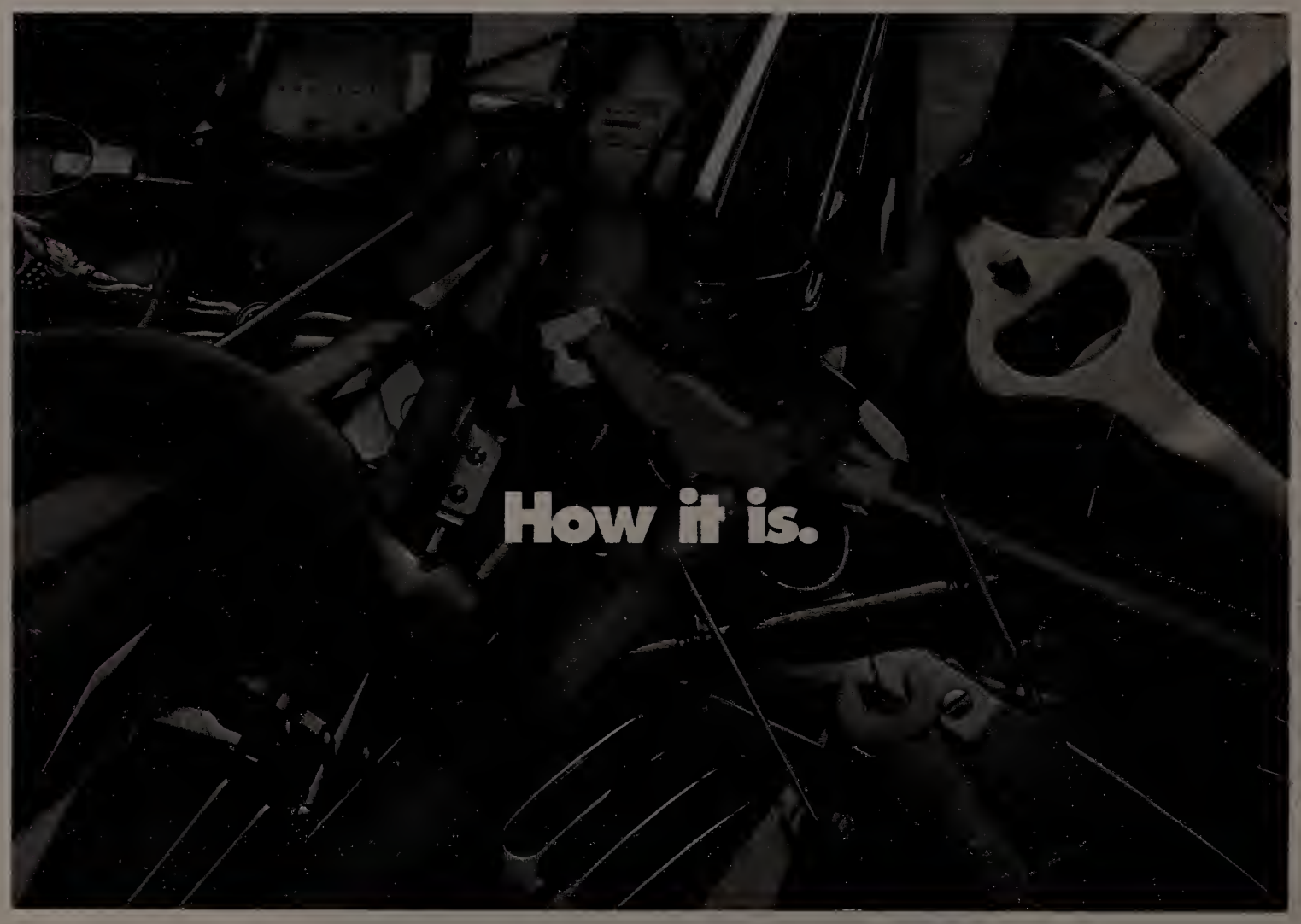
A Customer's Friend

E-mail is ideal for communicating with customers during crisis situations — if it's managed properly, said Robert Mirani, an analyst at The Yankee Group in Boston.

In the case of the airlines, E-mail is cheaper to deal with than phone calls. And companies equipped with automated systems can blast E-mails to frequent fliers to give them information about alternate flights or direct them to the Web page for more information.

But E-mail-based customer service isn't universal among airlines.

For instance, Southwest Airlines won't accept E-mail because, according to its Web site, "our ability to support E-mail in a manner consistent with our service expectations isn't fully in place." Site visitors are encouraged to send postal letters, not E-mail.



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RESOURCES

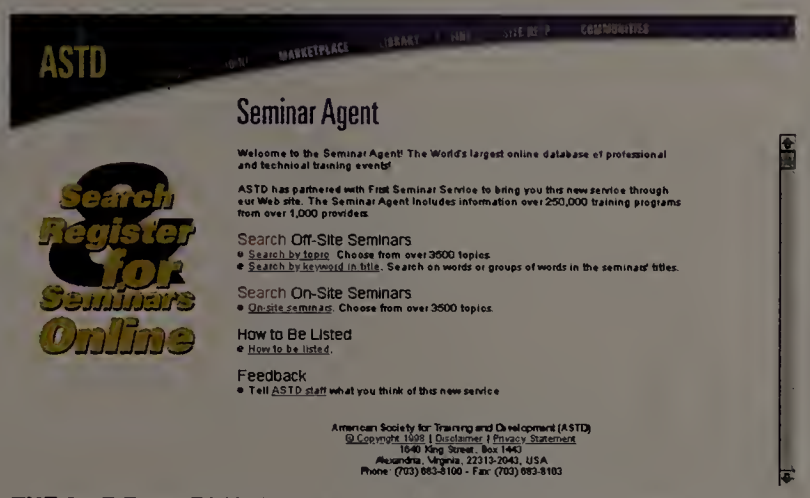
Conferences

Gartner Group Inc.'s Spring Symposium/ITxpo 99
San Diego Convention Center; March 22-24
■ For the first time, Gartner will hold a springtime version of its popular fall gathering for IT managers and leaders. The conference contains more than 100 sessions and 19 focused tracks, from application development to year 2000. Cost: $1,895-$2,395. Contact: Gartner Group in Stamford, Conn., at (800) 778-1997 or (203) 316-6757; Fax to Ashley Pearce at (800) 778-1998 or (203) 316-6774; E-mail: ashley.pearce@gartner.com; Web address: *www.gartner.com.*

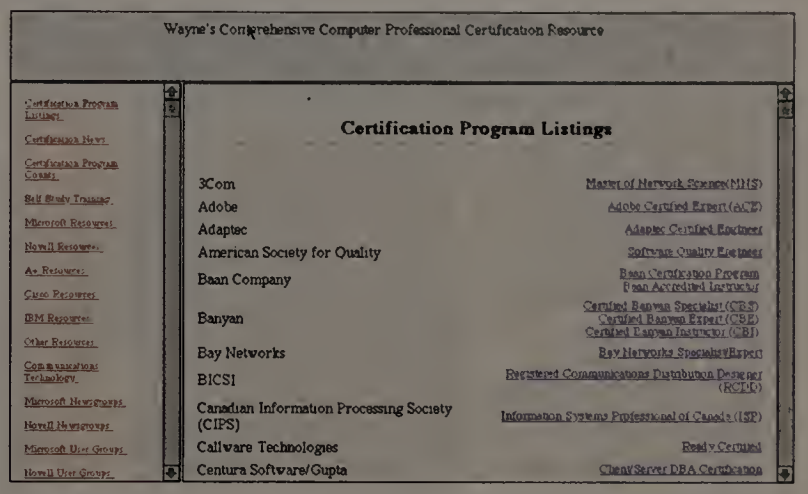
Internet Commerce Expo (ICE)
World Trade Center, Boston; March 22-25
■ Get the latest technological and marketplace information about electronic commerce. There are six conference tracks and more than 100 sessions, along with case studies. Cost: $1,095-$1,395 (preregistration discounts expire Feb. 22). Contact: International Data Group (*Computerworld*'s parent company), at (800) 667-4423; Web address: *www.iceexpo.com.*

Customer Relationship Management '99
Washington (D.C.) Convention Center; March 29-31
■ Companies want to get closer to their customers and boost their fortunes through technology. More than 90 conference sessions will teach you how to drive sales and boost service. (Taking place in agreement with Support Services Conference & Expo). Cost: $1,095-$1,395. Contact: ZD Events Inc. at (781) 433-1830; fax: (781) 449-1413; Web address: *www.crm99.com.*

AIIM '99 (Association for Information and Image Management)
Georgia World Congress Center, Atlanta; April 12-15
■ This is a key event for IT professionals and document-intensive businesses. Topics focus on knowledge management, electronic commerce and technologies of the future. Cost: $1,125-$1,225 by March 15; $1,225-$1,325 after. Contact: Debbie Chapman at AIIM International at (301) 755-2620; Web address: *www.aiim.org.*



THE SITE FOR TEACHERS, Seminar Agent has a wealth of IT-only info



WAYNE'S WORLD OF IT has a "schwinging" selection of certification info

Finding Training on the Web

Access these four sites to cut down on time spent looking for IT classes

BY LESLIE GOFF

COMPARISON shopping for information technology training on the Web can lead you through a maze of vendor Web sites until your eyes are bleary and your fingers are bleeding. It's enough to make you give up that New Year's resolution to learn object-oriented programming before you even crack open a book.

But don't despair. We bring you four sites that will cut your time looking for training so you can spend it where it counts — in class.

Best Bets

American Society for Training and Development (ASTD) Seminar Agent
www.astd.org/virtual_community/seminar_agent
The ASTD's site is aimed at professional trainers, but it includes this nifty "Seminar Agent" section that's a blessing to anyone looking for professional development opportunities. It boasts more than 250,000 seminars on more than 3,500 topics taught by more than 1,000 vendors — lofty claims, indeed, but very few topics relevant to IT professionals are lacking here.

Notably, a search for PeopleSoft Inc.'s human resources software was a bust, but searches for most other IT topics (such as SAP, Oracle, Project Management and NetWare) yielded ample choices — such as a whopping 956 seminars on Windows NT between December and June.

Registration is requested but not required. The search engine is easy to use, quick and thorough, enabling users to search by training topic or by keywords in a course title. You also can plug in locations or dates. Course descriptions are current and complete. Best of all, each one offers users the chance to request more information or register online — presto-chango, you're all set.

Wayne's Comprehensive Computer Professional Certification Resource
www.diac.com/-wlin/cpcert.html
In an old routine from his stand-up comedy days, Steve Martin quipped that banks always have officious names because no one would trust one called "Fred's Bank." The same rule of thumb can easily be applied to Web sites: Too often, personal collections of links by well-meaning individuals are highly subjective, poorly organized and out-of-date.

Wayne's Comprehensive Computer Professional Certification Resource is the exception to the rule. Maintained by Wayne Lindimore, a certified systems analyst at a large insurance firm in Denver, the site is comprehensive to a fault, listing the certification programs offered by more than 75 technology vendors and professional associations.

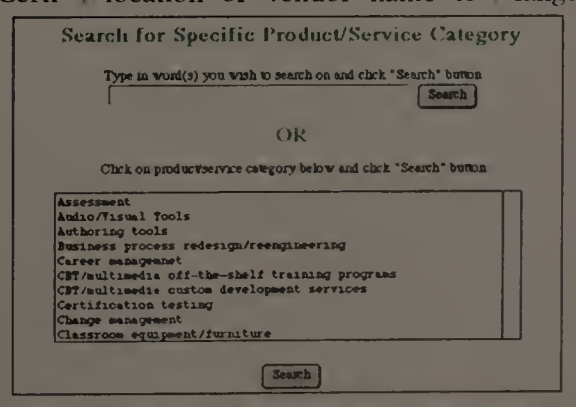
It's smartly organized, too. Lindimore links you directly to the certification pages at a vendor's site — not the home pages. With one swift click, you can get the lowdown on programs ranging from 3Com Corp.'s Master of Network
Science to Xplor's Electronic Document Printing and Professional Certification.

Moreover, using the links in the left-hand frame, you can find out how many IT professionals are certified in various technologies, get the most current certification news released by vendors, link to user groups and newsgroups and tap in to more than 40 resources for self-study and test-preparation materials.

Runners-Up

1998 IT Training Buyer's Guide
www.ittrain.com/guide/guide-index-product.html
Use this searchable database, developed by *Inside Technology Training* magazine, to connect with 115 IT training vendors and professional associations. Search by product/service (a categorical listing of public courses, distance-learning classes, multimedia courseware and training tools), location or vendor name to generate lists of relevant companies. Click on a company name for a description of its offerings, as well as contact information and uniform resource locators.

Be warned: The write-ups are provided by the vendors, but the editors have kept the hype in check. This site is especially useful if you're searching for training solutions for a team or department.



INSIDE TECHNOLOGY TRAINING magazine offers a searchable product/service guide

The Training Registry Inc.
www.tregistry.com
The Registry offers an exhaustive listing of courses, but it makes you work pretty hard to get detailed information. Course links take you out of the site and are frequently broken — be prepared to hit your "back" button more than a few times. Still, if you're patient, the site can be a decent ally for the training-minded IT professional. It provides information on instructor-led training, including both on-site and public classes and multimedia courseware, as well as an alphabetical list of training companies, lists of available facilities for training and conferences, speakers and presenters and training tools.

Search the course listings by topic or location. Topics include information technology/software development, Internet/intranet and programming languages and more. Each category is broken down into a seemingly unending series of technical subcategories. Searching by geographic area covers Washington and 35 states, with the larger states organized by metropolitan area. Courses in Canada and the U.K are also listed. ◗

Goff is a freelance writer in New York.

NEW REPORTS

Switching Review And Outlook

International Data Corp. has released a report called "LAN and ATM Switching: 1998 Year in Review and 1999 Outlook."

According to the Framingham, Mass., a sister company to *Computerworld*, research firm, companies this year will decide what to buy based not on equipment comparisons, but on how vendors support total network services.

The report costs $1,500.
www.idc.com

E-shopping Review

Patricia Seybold Group has released a report that compares how 35 popular "E-tailers" performed during the recent holiday season.

Called "Top 10 Customers.com 1998 Holiday E-Tailers," the 12-page report rates the retail Web sites against 30 criteria such as gift wrapping, gift cards, handling returns and the ability to ship to multiple addresses.

The Boston research firm said it placed holiday orders with more than 20 of the sites and based some of its findings on how the orders were handled.

The report costs $895.
www.psgroup.com

On the Outs

Percentage of companies that have outsourced . . .

25%	Application development
7.2%	Data center operations
6.9%	Applications maintenance
6.0%	Network management
4.4%	Help desk operations

Base: Interviews with 426 worldwide companies, November 1998

SOURCE: CUTTER INFORMATION CORP., ARLINGTON, MASS.

Know Thy Customer

Top challenges in customer relationship management:

76%	Integrating delivery channels
75%	Knowing the customer
38%	Creating a customer-centric organization

Base: 133 CEOs at worldwide financial services companies

SOURCE: DELOITTE CONSULTING GROUP, NEW YORK

BRIEFS

Comings And Goings

BRUCE CLARK, former senior vice president and CIO at retailer **BRYLANE INC./LANE BRYANT** in New York, has been named senior vice president and CIO at **AUTOZONE INC.**, a Memphis-based retailer. He replaces **STEVE VALENTINE**, who was named senior vice president/international. . . . **MICHAEL P. GAYNOR** was named vice president and CIO at **AVERY DENNISON CORP.**, a Pasadena, Calif.-based maker of labels and adhesive materials. Gaynor, 49, comes from **COMPAQ COMPUTER CORP.** in Houston. He replaces **HANS GOEMANS**, who will manage special projects for information systems at Avery Dennison.

Top Banking Innovators

QSpace Inc., a San Francisco-based provider of credit reports via the Internet, was named one of the Top 20 Financial Services Innovators of 1998 in "Online Banking Report," a monthly financial services industry newsletter. Other companies included Microsoft Corp., Intuit Inc. and Wells Fargo & Co.

JIM CHAMPY

Strange 'Web'fellows

MOST COMPANIES have now faced the inevitable: Customers rule. Totally. Indeed, the advent of Internet auction services such as EBay — and the digital convenience of an Amazon.com — are training a vast generation of consumers and businesses in a whole new way to "shop around." And this phenomenon isn't going away. Sensing this, almost every company I know of is dramatically rethinking its IT infrastructure investment to broaden its customer channels. What hasn't been widely understood, though, is this principle's concomitant: To offer more choice and value to their customers, companies will have to cooperate more with their competitors. The necessity is to create "our" customers — and lots of them — so that all can share.

This idea, sometimes called "co-opetition" or "business alliances," has been, up to now, an academic notion. A large number of alliances — especially those between technology companies — have failed. For example, RealNetworks, which makes devices for watching video and listening to audio over the Internet, had a falling-out with Microsoft. It was a short-lived "co-opetive" relationship.

The problem was that RealNetworks, with an 85% share of the market, directly competes with Microsoft's Windows Media Player. Yet, co-opetition isn't entirely dead for RealNetworks. It still has deals with AOL, IBM and Intel.

An alliance fails usually for one of two reasons: one competitor becomes powerful and decides it must dominate the other, or the "partners" lose sight of their joint objectives.

In the Internet domain, the shared objective is simple: Build a marketplace that's so complete in its scope of service and product that your customers won't need to go anywhere else. That notion has only recently been understood in the services business. An example is Charles Schwab & Co.'s bold decision to sell competitors' mutual funds. Schwab recognized it would hold on to more customers if they didn't have to go elsewhere to shop for investment products. But even today, that idea still seems foreign to some large financial services companies.

In digital marketplaces, the idea is catching on. Last August, Weirton Steel announced the formation of an independent company called MetalSite to offer a secure, Internet-based marketplace for the sale of secondary metal products from a number of U.S. suppliers (*www.metalsite.net*). Several of these are Weirton's competitors, but there's no better way to get customers to come to your site than to offer most of the industry's available inventory.

Of course, there's the strategy of becoming so big that you can directly offer all the products and services your customers need without the help of your competitors. But recognize that there are very few companies that will achieve that scale and, in the end, it may not be the most cost-effective way of holding on to customers. Even Amazon.com can't keep every book title in its warehouses. I wouldn't be surprised to see Amazon inviting specialty bookstores into its marketplace, rather than competing.

In E-commerce, companies will have to cooperate with competitors.

But operating side by side with competitors requires attention to fair play and good behavior. Otherwise, expect your alliance to fall apart as other alliances have. So here's some advice:

- Remember that the destiny you share is the creation of the most complete marketplace that will hold the attention of the largest number of customers. Hold off killing each other — at least for a while!
- Don't try to dominate the alliance. The company with the best product and service at the best price will make the sale. Digital markets are near-perfect.
- Respect what your competitors offer. Sell your benefits, not their faults.

Some of this may sound fundamental — and it is. We're building markets here. The first step is to learn how to share these new channels. ◗

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. Contact him at JimChampy@ps.net.

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Constitution.

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Fed-up users and consumer advocates say vendors are tracts are ground out. At stake: higher costs and basic

UNFAIR!

ABOUT ARTICLE 2B

Q. What is UCC2B?

A. Article 2B is a major revision to the Uniform Commercial Code (UCC), which would govern contracts for the sale, licensing, development, distribution, maintenance, documentation and support of computer software and other information that can be distributed digitally. The law wouldn't directly affect negotiated software licenses; it's meant as a default rule when there is no negotiation – as in the case of shrink-wrapped software – or when negotiation fails to address an issue.

Q. How would UCC2B become law?

A. Like all changes to the UCC, 2B is being developed by the National Conference of Commissioners on Uniform State Laws and the American Law Institute, both voluntary associations of lawyers, judges and law professors. Once a draft is approved by both bodies, which could happen by next spring, it goes to each state for ratification.

Q. How did the software lobby get enmeshed in the process?

A. User advocates say the software industry was on its toes during the early stages, while the corporate user community was caught flatfooted. The committee needed to learn the issues, and the software industry was there to teach them. And practically speaking, industry support is essential to get a commercial law enacted.

■ For more information on Article 2B, see www.2bguide.com, www.badsoftware.com/uccindex and www.cptech.org/ucc

"THE SOFTWARE INDUSTRY has been the 800-pound gorilla that's gotten its way on just about everything."

That's how Todd Paglia, staff attorney at Ralph Nader's Consumer Project on Technology, describes the ongoing drafting process for Article 2B of the Uniform Commercial Code (UCC), which would govern the sale and licensing of software.

Virtually everyone involved except the software industry insists the current draft and the process are biased against users. They say adoption of the draft, expected next year, could double the cost of shrink-wrapped software for user companies, validate previously unenforceable terms in software licenses, thwart competition, threaten to scuttle mergers and acquisitions, allow vendors to sabotage user systems and place the burden of negotiating and litigation solely on users.

"The process just plain stinks," says Randy Roth, assistant director of information services at Principal Financial Group in Des Moines, Iowa. He has represented the Society for Information Management (SIM) at the drafting committee meetings.

User advocates claim their presence at drafting meetings is window-dressing and their input ignored. "The software lobby is in tight. We're rarely able to get a reasonable provision in," Roth says.

"The user community is having to fight uphill to get back to a level playing field," says Barney Kantar, speaking as a SIM member, not in his role as software purchasing manager at Du Pont Co. in Wilmington, Del.

Vendors disagree. "What you're seeing here is a coordinated effort to besmirch the reputation of the drafting committee," says Mark Nebergall, counsel to the Software and Information Industry Association, formerly the Software Publishers Association.

Straining Credulity

User representatives participating in the UCC2B process point to a series of incidents that have led them to doubt the drafting committee's good faith. Among those incidents are the following:

■ "We're asked for input, we give it and they do something totally different," Roth says. He recalls that in the debate over self-help, the committee gave SIM members the task of drafting a proposal, then blindsided them by presenting and immediately passing a different one. "There were snickers and sneers from the licenser group," he recalls, and a subsequent committee press release praising the balanced input. "That's the kind of bull we've been putting up with," he says.

■ In a discussion of "click-wrapped" software (see related story, next page) software advocates argued that posting their licenses on the Web was so easy that most companies already did it, so it wasn't necessary to require it, recalls Cem Kaner, user advocate and co-author (with David Pels) of *Bad Software* (Wiley, 1998).

But when research showed that very few sites posted their licenses, the argument changed from "this will happen automatically" to "this is very difficult," Kaner recalls. Despite the flip-flop, the drafting committee sided with the vendors.

■ Another participant recalls that after a long debate over some important wording in a provision, the committee agreed to five key changes. But months later, a new draft retained all the old wording.

■ Kaner recalls working out a three-part compromise on an issue with a software representative, assuming that the whole deal would be accepted or rejected by the committee. But when the compromise was presented much later, the committee adopted the parts favoring the software industry and rejected the part favoring users.

Committee reporter Ray Nimmer disputes several

of the incidents recounted by user advocates. For example, regarding the allegation that key provisions never made it into the draft, he says, "I don't think the committee agreed to do that." He explains that interpreting the committee's will is easier said than done. "I'm trying to keep track of 120 people making comments, plus I'm responding to suggestions," he says. "It gets pretty intense."

Defending the Vendors

Robert Holleyman, president and CEO of the Business Software Alliance, a vendor representative, maintains that users are missing the big picture. "We have to not look at the trees, which is the drafting process, but look at the forest," he says. "The draft is good because it will really allow the codification of the three Rs: replace, refund or repair."

Committee Chairman Carlyle "Connie" Ring insists the current draft includes several protections for users, such as the following: state consumer protection law overrides Article 2B; "unconscionable" terms, or terms contrary to fundamental public policy — such as prohibiting written reviews of a software program, which would violate freedom of speech — are unenforceable; and the concept of "mass market" extends consumer protections, in very limited circumstances, to some business users, such as when a small company buys one retail copy of a shrink-wrapped program.

But those protections are more easily enumerated than exercised, says David Rice, professor of law at Roger Williams University in Bristol, R.I., and an American Law Institute (ALI) representative on the 2B drafting committee.

"The defaults are set almost entirely on the licensee/user side having to do the bargaining," he says. "The person who brings the challenge has to bear the burden and the cost of litigation."

Rice says vendors often defeat user safeguards with one-sided arguments about the cost of a provision. For example, consider the rules restricting transfer of a license (see related story at right), he says. "I see that as serving the software and information publishers' interest with no consideration of the costs to the rest of the world."

Proponents of the draft say buyers who don't like default terms are always free to negotiate their own. But Rice demurs. "You can negotiate," he explains, "but standard forms are enforceable, and that means the burden of negotiation is on [your] side. Unless you've got an awful lot of bargaining power, these terms are not bargainable."

The ALI, which cosponsors the UCC process, has declined to support the current draft, and recently, more than 20 participating groups have given up trying to fix 2B and recommended that it be tabled. "At some point," Paglia says, "the weight of opposition becomes so great they will have to put it away."

Nimmer says he sympathizes with consumers, but corporate users are different. "SIM is a large number of very, very large companies," he says, "and their argument is that they should be protected against small software companies. That doesn't make sense."

"I'm not saying that some of the criticism by users isn't legitimate," Ring says. "If it were up to me, I would probably write a different product than the current 2B," but the software lobby would defeat it. "I've got to develop a consensus, and that's got to fall in between a glass half-full and a glass half-empty."

But many user advocates say it's time to put 2B out of its misery and throw jurisdiction back to the more general Article 2, which currently governs software transactions. "2B cannot be fixed," Paglia says. "Our only strategy at this point is to kill it."

Melymuka is Computerworld*'s senior editor, management. Contact her at kathleen_melymuka@computerworld.com.*

WHAT'S WRONG WITH 2B?

The following are some chief problems with the current draft of Article 2B from the perspective of participants and observers.

■ **Vendors can require buyers to commit to the sale before they see the software license.** "You ought to be able to click on the terms before you are committed to an order. That's sort of basic." – Michael Traynor, liaison on the 2B process, American Law Institute (ALI).

■ **Vendors can prohibit transferring the license without permission.** "Think about the Citibank and Travelers merger. They [would] have to get an inventory of every software license, evaluate terms, go to the publishers and get approval. The transaction costs of doing this are enormous, and the wait for [approvals] can hold up a major deal." – David Rice, ALI representative on the 2B drafting committee.

■ **Vendors can electronically shut off a buyer's system if they believe the buyer has breached the contract.** "Vendors should not have that huge a sledgehammer to hold over us." – Randy Roth, Society for Information Management representative.

■ **Shrink-wrap and "click-wrap" licenses, which buyers can't see until after the purchase, will be enforceable.** "A basic notion in contract law [is] that both parties have to agree for a contract to be formed." – Jean Braucher, ALI member, professor of law, University of Arizona.

■ **Only mass-market customers, which excludes most businesses, have a right to a refund after viewing the license terms.** "Non-mass-market customers can reject the license, but they are not entitled to a refund." – Cem Kaner, user advocate.

■ **Except for clashes with "fundamental public policy" or "unconscionability," which is a very high legal standard, courts may not intervene in a licensee's terms.** "The question is whether we're going to give licensees any rights to claim that a particular term is not enforceable." – Traynor

:alling the shots as new legal guidelines for IT con-
egal protections for users By Kathleen Melymuka

GARY LAUFMAN

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> CEM KANER, USER ADVOCATE AND CO-AUTHOR OF *BAD SOFTWARE*

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> MARK NEBERGALL, COUNSEL TO THE SOFTWARE AND INFORMATION INDUSTRY ASSOCIATION

DAVE WEIDENFELD, McDonald's top IT negotiator, knows how to keep vendors in line

MARC BERLOW

Putting Vendors On the Grill

Dave Weidenfeld *functions as McDonald's Corp.'s chief technology counsel, the in-house lawyer with the final legal word on the Oak Brook, Ill., fast-food giant's information technology contracts. We asked this tough negotiator to share what he has learned after 15 years on the IT legal front line.* **Allan E. Alter**, Computerworld *department editor, Managing, conducted and prepared the following edited version of the interview.*

Why did you decide to specialize in IT contract law? I was interested in what technology does. And I enjoy working with the technology people. They're straightforward. Their real vision is to help create the future. It's fun to help them get there.

What's the most ridiculous clause you've ever seen in an IT contract? There's a bunch that compete. The one that really leaped out was this business about a licenser having the right, when you reported a problem, to decide whether the problem was a typo or an error in the product specifications. That makes their ultimate responsibility to simply correct the specifications, not to fix the problem.

Who are the toughest vendors to negotiate with? Microsoft is really hard if you're trying to affect the price. They are among the least willing of anybody to make changes to their contracts.

Each of the big companies has a sacred cow they don't want to touch. Historically, Computer Associates wants you not to modify their form because of how it sets up licensing. IBM certainly loves their own forms, too, but they've been more amenable to change in last few years than in the past.

What are some of the other sacred cows? Who can use the software on your behalf. Computer Associates is more sensitive than others. Most vendors want to make sure you're not going to let a service bureau provide processing for you, and therefore process a number of people off the same license.

What's the best time of year to negotiate with vendors? At the quarter or year's end. If the vendor is not where they wanted to be in revenue, there's a tremendous internal pressure to close deals.

What's the most important contract language to seek and destroy when you go over a contract from a vendor? You want to make sure the contract never talks about "then-current" fees. "Then-current" is whatever the vendor feels like charging.

If you install a mission-critical system, one of your fears is that they will stop supporting it. You need a guarantee there will be a migration path that doesn't cost you a fortune. Watch out for any language about dropping support.

How do you get good at negotiating with vendors? You learn by doing. But more than anything else, it's a lot of training. It's important for IT folks to train their lawyers. If IT people don't, the lawyers won't recognize the issues that are important to them.

What are the dumbest common mistakes IT people make when negotiating? The easiest one is to select the vendor first, then negotiate. Another is to communicate to a vendor in such a way that they understand the deal is theirs. The third is to let the vendor control the clock — where the vendor says you only have until Friday to buy this software. If you tell that to a car dealer, you know what will happen when you negotiate over the price.

What is the most underutilized negotiation tool IT people have? The big one is to not go through an RFP [request for proposal] process. The advantage when using an RFP is you get multiple vendors, a level playing field and the ability to negotiate with more than one vendor before you select the vendor you go with. That makes all the difference.

Who are the best people to negotiate with on the vendor side? If you want to get concessions that the vendor doesn't usually grant, you are better off talking to the local sales branch. They have more latitude to do local, specific deals. When you are talking about far-reaching changes, it will take corporate assent, but you will still need the local champion — someone at the vendor who sees the value of the relationship with your company.

What do you do when a vendor says "no" to a contract change you really want? How do you get it to agree? It's a question of who has more stamina. You have to be willing to bring that issue up again and again. "No" doesn't mean anything.

What about getting year 2000 protection? I think Y2K clauses belong in every software license agreement we enter into. A vendor who says, "I can't live with your standard" is a vendor we need to tell, "We can't live with your product." ◗

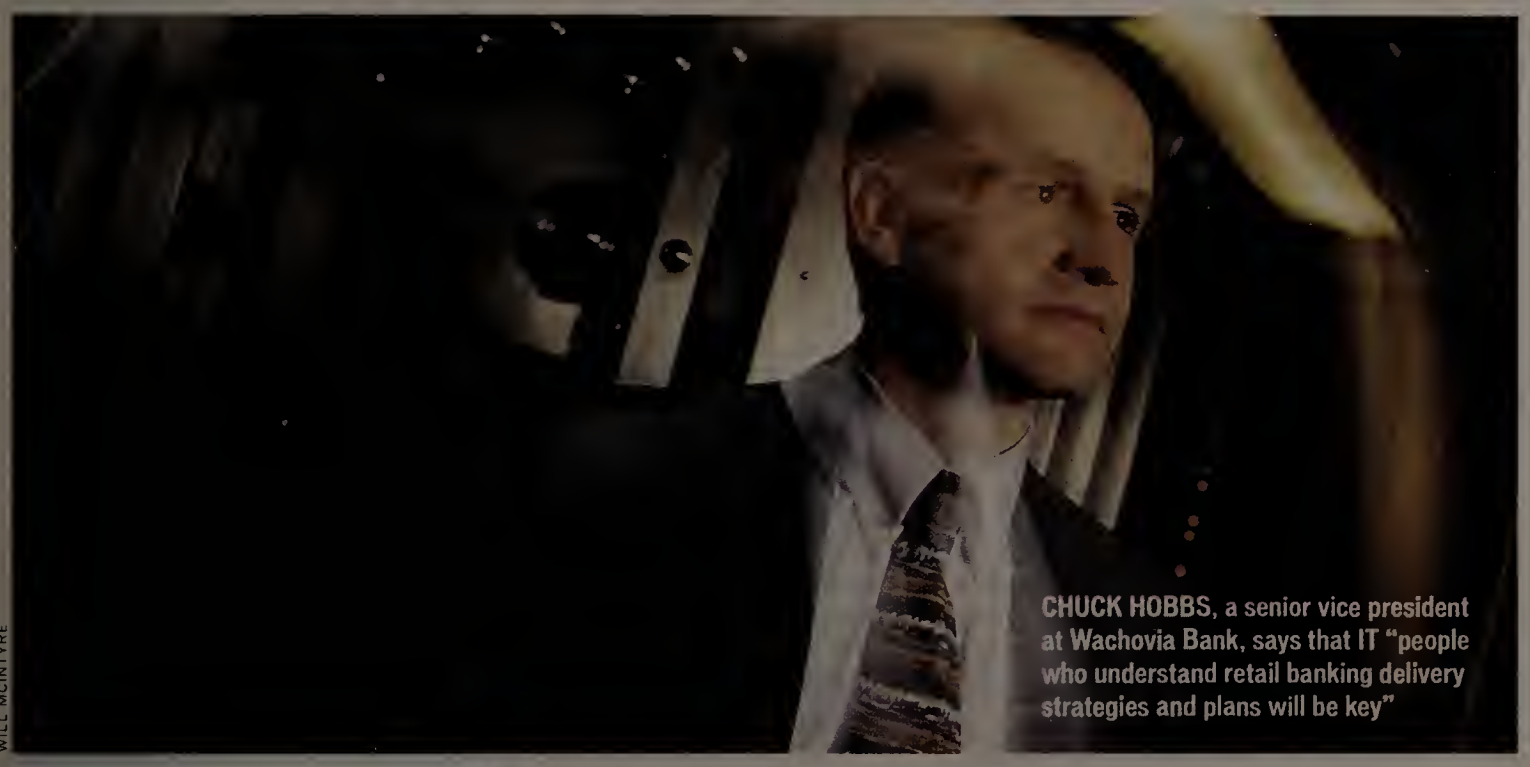
Weidenfeld's Top Three Techniques for a Great Deal:

1. You need to put together a team with all the skills you need to complete the transaction: business, technical and legal. That team has to be kept together so the knowledge it builds over time isn't dissipated.

2. You need more than one live vendor. No competition leads to a very difficult negotiation.

3. The folks in the IT organization must know what's going on and be willing to let you say no. Even if they need the solution, they need to give you the capacity and the stamina to say no. The vendor must know your "no" means "NO" – that they can't go above you to an officer.

Industry BEST BETS



WILL MCINTYRE

CHUCK HOBBS, a senior vice president at Wachovia Bank, says that IT "people who understand retail banking delivery strategies and plans will be key"

Demand for skilled IT professionals remains high across the board, but especially in these 10 job markets

By Leslie Goff and Emily Leinfuss

Banking and Insurance

Banking and insurance firms certainly have a lot of legacy systems to worry about. But the year 2000 problem isn't the only thing driving information technology hiring in those industries.

The banking industry continues its consolidation through mergers and acquisitions, and insurance firms are relying on data more than ever with the upheaval in health care policies. So both industries are moving to bring a breadth of technology skills on board, from System 390 mainframe skills to Internet and security talent to Windows NT expertise to database skills.

"We don't build homes or widgets; information about our customers, markets and products is our biggest asset," says Ron Kunz, assistant vice president of architecture and strategy at Allstate Insurance Co. in Northbrook, Ill. "We're like an information factory."

Though year 2000 has skewed the demand for some skills, after it's all over, "We'll just see a shift back to more of the marketing programs and business initiatives that we would rather be working on than Y2K," Kunz says.

Shifts in the way information is delivered to customers are shaping hiring demand in banking, says Chuck Hobbs, a senior vice president and group executive of information services at Wachovia Bank in Winston-Salem, N.C. Internet-based banking, mortgage loan automation and development of data warehouses are just some of the projects creating demand.

What hiring managers value are good business sense and an understanding of what users are trying to accomplish. "That's more critical than ever before because banking is changing so quickly that in IS, we have to be able to adapt. So people who understand retail banking delivery strategies and plans will be key," Hobbs says.

Building and Construction

The building and construction industry encompasses many niches, from residential construction to industrial plant design to roads and highways and more. And they share a consistent need: to facilitate collaboration among contractors, designers and other partners.

To that end, Web-based business practices and extranets are emerging as a mainstay, and automated project scheduling and management systems are rapidly proliferating. Together, they gradually are creating new opportunities for IT professionals, says James House, director of information systems at Morrison Knudsen Corp. in Boise, Idaho. House is based at the company's largest division, Engineers and Constructors in Cleveland.

"This is a low-margin industry, and while IT has always created a competitive advantage on the engineering side, on the building side, we are only recently seeing the benefits from large investments in IT," House says.

House says he's looking for people who are experienced in the construction business and understand the importance of project management to the business, as well as to IT. He says he likes to recruit engineers from the business side into the IT group.

Business Services

Business-to-business services firms, such as human resources consultants, marketing companies, process specialists and others, have to be at the top of their game technologically to earn credibility with their clients.

Moreover, their IT solutions must be nimble — ready to adapt in a flash to changing business requirements and new client needs. Couple those demands with overall market expansion, and you have a booming sector for IT professionals. The industry needs professionals who can deal with a multitude of end users, customize off-the-shelf software for specific situations and manage rapid application development.

"We need to be very up-to-date to attract clients and inspire their confidence in us," says Gary Zimble, director of technical services at Headway Corp. and The Whitney Group in New York, which provides human resources consulting and staffing services.

Zimble says he looks for IT workers who can help build those internal efficiencies. He says he's more likely to hire a rookie with proven smarts than an experienced worker "who has a vague knowledge of a lot of different subjects."

Health Care

The overall trend toward managed care and the increasing integration of patient-care systems with pharmacy, billing and other automated medical systems is crashing head-on with critical year 2000 requirements.

"We're not competing only against health care providers, but against the whole IT industry. And the demand is clearly outpacing the supply," says Jim Hedeman, information services administrator at Johns Hopkins Medicine Center in Baltimore. Hedeman serves as a liaison between IT and human resources.

Health care, like all industries, is recognizing the need to give all decision-makers — doctors, nurses, pharmacists, finance and billing staff, and managed-care contractors — timely and high-quality information. IT needs solid professionals who can join various platforms and systems together into a seamless whole, Hedeman says.

Some positions demand industry experience. Those include folks who have worked with vendor Shared Medical Systems' software. Others require proven technical experience, such as linking a mainframe billing system with a midrange Unix-based pharmacy system, Hedeman says.

And though new projects continue in the face of year 2000, the millennium bug is provoking a careful evaluation of which systems to pursue now and

Continued on page 56

Continued from page 55
which to put off until later.

Another project that will continue this year, representing a key trend in health care, is the development of a revenue recovery system "with regard to changes in managed care and changes in Medicare rules. We're trying to be more responsive to our payers," Hedeman says.

State, Local and Federal Government

While the federal government has downsized overall, it's looking to IT to enable it to carry on business with fewer people. And at both the federal and state levels, the Clinton/Gore administration's emphasis on using technology to bring government to the people is pushing agencies onto the Web.

So most federal agencies have contracted out much of their analysis, development and maintenance work. But they are in need of "experienced IT managers who can run a competition for services, manage a project, and make the business case for new efforts," says Sandra Gibson, CIO and director of the IT and communications division at NASA headquarters in Washington.

The federal government is relying more on the Web for communicating with the public. With recent cases of hackers taking over government sites, Net security specialists "can probably write their own tickets," Gibson says.

The Web also is driving IT hiring in state government, says Kym Patterson, CIO at the Arkansas Economic Development Commission in Little Rock. Although civil service has a lackluster reputation, "the culture is more lively than people think," she says. "Our state department of information systems has raised its rates and is able to pay better, so we are attracting people from the private sector."

Retail

The retail industry has awakened to technology in a big way and is more advanced than its reputation says it is. "Retailers finally realize that technology touches all business segments now, from operation to product planning, receiving, distribution, point-of-sale and electronic commerce," says Butch Jagoda, CEO of Helzberg Diamonds in Kansas City, Mo.

Because that translates to the need for a wide array of skills and technologies, Jagoda seeks IT professionals who possess business acumen and understand retailing. The major IT challenges in retail are electronic commerce and automating the whole supply chain, confirms Colleen Pero, director of human resources at The Limited Inc. in Columbus, Ohio.

MOREONLINE
For links to organizations within each of these industries, visit our Web site: **www.computerworld.com/more**

Overall demand for retail technology professionals outstrips the supply, Jagoda says. "We are looking for people who can really augment technical skills with business knowledge, communication skills and who can understand the pieces and parts of the supply chain," Pero says.

Transportation and Utilities

Transportation companies fighting for competitive edge are racing to develop systems to power "intelligent freight" — where electronic tags can identify and track every shipment along its delivery cycle.

At Ryder Integrated Logistics in Miami, that means enterprise-based, Web-focused, next-generation applications. The company needs IT professionals who can handle C++ coding and Java application development, as well as database architects and engineers, and integration specialists who can handle Common Object Request Broker Architecture standards. But especially wanted are effective, efficient senior programmers, says David Shea, vice president of technology.

As technology accelerates, so do salaries in the transportation and utilities industry, Shea says. And as long as IT professionals are customer-focused, they will advance in this industry.

Utility companies face similar challenges as they move from older, more staid businesses to free-market competitors. At Consolidated Edison Company of New York Inc., IT professionals need to be flexible and willing to learn, says systems manager Steve Marcotrigiano. "We look for people who are analytical and have a good understanding of technology," he says. Useful technology skills include experience in client/server, Internet and intranet development and mainframe development skills.

Manufacturing

The pressure of year 2000 and supply-chain management in the manufacturing industry resulted in a mass move to enterprise resource planning (ERP) software. Now, the ongoing care and feeding of ERP development is a big priority.

IT professionals with experience in ERP and general client/server development can write their own ticket in manufacturing, says Miren Lolly general manager of IT at Ore-Ida Foods Inc., a subsidiary of H. J. Heinz Co. in Boise, Idaho.

"There is a high demand for technicians, not only in programming but in the network and database areas," Lolly says. That's because manufacturing companies are exploring the Web and electronic commerce to create new channels of business, says recruiter Jeff Leon, managing director at Russell Reynolds Associates in New York.

IT professionals most likely to succeed in manufacturing are those who have a vision and can develop systems that impact the entire supply chain and cost structure of a company, Leon says.

Telecommunications

The many faces of the telecommunications industry — all methods of communications, network and Internet convergence and access network equipment developers — are vying for the same IT talent.

Hiring demand grows monthly, as do the size of salaries, according to Kim Frazier, employment manager at Aztek Engineering Inc. in Boulder, Colo. In fact, Frazier considers telecommunications to be the fastest-growing industry in the world.

IT professionals are more apt to be exposed to cutting-edge technology sooner in this industry, says Jim Kenner, a vice president at recruitment firm Pencom Systems in Washington. Networking and Internet technologies, in conjunction with Java, are at the forefront, he says, along with a strong demand for C++ and Visual C++ developers, Unix and Windows NT administrators and database developers.

IT professionals who work in the telecommunications industry need to be able to handle a great deal of complexity and excel at integration as telecommunications converges with media and the Internet, Leon adds.

Education

Margaret Knox's dream IT hire for development and programming would be a musician with a hard science background who's a team player. "You would get creativity, and logic and procedures and user-orientation all in one," says Knox, associate director of academic computing and instructional technology services at the University of Texas at Austin.

The education arena touts its atmosphere of learning, inventiveness, experimentation and yes, even fun, as a foil for offering the lower end of the salary range. But those bottom-level salaries may be changing, thanks to the competitive job market, Knox says. "We are doing a better job of matching commercial salaries," she says.

In administrative systems, which are most like business systems, David Trevvett, director of administrative system at the University of Chicago, says classic IT skills, including Cobol and CICS, are still in demand in education, but the industry also needs people with database skills — both transactional and for data warehousing. "We have the complexity of huge corporations but not the size. A given person may wind up doing a wide mix of tasks," he says.

Goff is a freelance writer in New York. Leinfuss is a freelance writer in Sarasota, Fla.

Top IT Jobs and Salaries*

JOB TITLE	BASE SALARY
Building and Construction	
Web specialist	$50 to $65
ERP specialist	$70 to $80
Database administrator	$60 to $75
Sr. network specialist	$60 to $70
Business Services	
Network administrator	$45
Project manager	$45 to $65
Help desk specialist	$32 to $38
Junior app. developer	$40+
Senior app. developer	$80+
Retail Industry	
Project manager	$65 to $75
Systems analyst	$50
Systems programmer	$40
Programmer/analyst	$30 to $37
Transportation and Utilities	
Senior systems analyst	$61
Sr. systems programmer	$55
Network administrator	$50
Programmer/analyst	$44
Manufacturing Industry	
Systems analyst	$59
Sr. systems programmer	$54
Network admin./analyst	$49
Programmer	$41
Telecommunications	
Project manager	$100+
Senior systems analyst	$75 to $100
Sr. programmer analyst	$65 to $90
Programmer/analyst	$40 to $50
Education	
Senior systems analyst	$45
Project mgr./systems prog.	$40
Programmer/analyst	$30
LAN manager	$28

SOURCE IT MANAGERS INTERVIEWED FOR THIS STORY

JOB TITLE	COMPENSATION
Banking and Finance	
Sr. systems analyst/admin.	$56
Webmaster/Web designer	$57
Database analyst	$63
Sr. programmer/analyst	$59
Health Care	
Project mgr./systems prog.	$59
Database analyst	$46
Senior systems analyst	$55
LAN manager	$56
State, Local and Federal Government	
Webmaster/Web designer	$41
Director, IT operations	$63

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SCHOOL-TO-WORK PROGRAMS: high hopes, low turnouts

Constrained by the well-publicized shortage of information technology people with four-year college degrees, IT companies are using school-to-work programs to turn high school and two-year college students into potential hires.

By Steve Alexander

COMPUTER HARDWARE and software vendors seem to be leading the way in targeting that potential labor pool. But the success of those efforts remains unclear because most of the programs are new and only a handful of new hires have resulted.

Also, the future of school-to-work programs is clouded by a phasing-out of federal grants to support them in two years. Some programs may not survive the transition to nonfederal funding.

Although they're being pressured into school-to-work programs by the IT workforce shortage, IT companies see two other advantages to the programs: The workers can be hired for as much as 20% less than four-year college graduates, and they often require less training to become productive because of their school experience.

IT companies' support of high school and two-year college programs sometimes includes only curriculum planning. But it can extend to teacher training, company-provided instructors and student internship programs.

Planting Seeds

Cisco Systems Inc. has its 1-year-old "Cisco Network Academy Program" in place at 1,043 high schools and colleges in 49 states. Under the program, Cisco brings to the academic world its networking certification classes for IT professionals. Cisco hopes the program will create potential Cisco employees and seed the market with young professionals who know Cisco's products.

The Cisco program provides schools with a cost-free, Web-based curriculum, an assessment system and training for teachers. Schools pay a nominal fee for routers used in the classroom. Cisco is spending "millions of dollars" on the academy program, says Scott Knell *(sknell@cisco.com)*, Cisco's higher-education marketing manager in Santa Clara, Calif. "You must be realistic and say this is going to be expensive."

So far, Cisco has hired only one of the academy students: part-time maintenance technician Felicia Voss *(vossf@hotmail.com)*, 18, who graduated last spring from San Francisco's Thurgood Marshall Academic High School. Approximately 40 high school seniors started the Cisco program at her school, but only 20 finished because the work was difficult, Voss says.

"We spent so much time in class, and we stayed after school until 8 or 9 p.m. But it looks good on your résumé if you've taken this class because it's really hard-core, not something simple," Voss says. Now a freshman at the two-year College of San Mateo in San Mateo, Calif., she plans to transfer to a four-year school to study computer engineering.

Sun Microsystems Inc. began school-to-work programs early last year at Mission College in Santa Clara, Calif., and Ohlone College in Fremont, Calif., both two-year schools. Students work on certification as Unix system administrators, and Sun helps with curriculum design, offers teacher internships and sets up computer labs, says Leslie Bowers *(leslie.bowers@sun.com)*, Sun's enterprise network services workforce program manager in Milpitas, Calif.

[With school-to-work programs] we can train them faster and get them to full productivity more quickly.

PAT DEAGMAN, GENERAL MANAGER, SUN'S ENTERPRISE NETWORK SERVICES

The program's goal is to increase the IT hiring pool while seeding the market with Sun-related expertise, says Pat Deagman, Sun's vice president and general manager of enterprise network services in Palo Alto, Calif. What's more, Sun expects to hire the two-year college graduates for approximately 20% less than it pays four-year graduates, and it should be able to train and advance them faster because of their college studies, Deagman says. But the proof of that concept still lies ahead.

Other companies also are betting on the future. A year ago, Oracle Corp. began a two-year, $250 million investment in school-to-work programs at several two- and four-year colleges.

The Autodesk Foundation, which is 70% funded by Autodesk Inc. in San Rafael, Calif., since 1993 has offered high schools a variety of on-the-job IT experiences, including "shadowing" a professional at work, having staffers give talks to students and offering internships for the help desk, programming, quality assurance and testing. Interns can work for school credit or be paid an average of $7 per hour, says Judy Morgan *(judy.morgan@autodesk.com)*, director of school-to-career programs at the Autodesk Foundation.

"It increases the pool of qualified applicants, reduces the costs of training, is good for the company's reputation in the community and enhances employees' morale by letting them work with students," Morgan says. For the program to work, both interns and their company managers must know their responsibilities, and someone must follow up to make sure the arrangement is working, she says. The company believes its mentorship of students will pay off for the industry, but it has few students on staff.

Dan Trimble *(dtrimble@edgemedia.net)* started as an Autodesk Foundation student intern and kept on after his 1997 graduation from Terra Linda High School in San Rafael, Calif. As a senior, he worked 30 to 40 hours per week and got school credit for it. The next year, he became a full-time employee and is now manager of Autodesk Foundation's Internet development.

"This program is aimed at everyone, college-bound or not," Trimble says. "Students have found the program has given them a new life: They've been able to learn how to work, what it's like to be in a corporate atmosphere, how to deal with other people and how to be responsible."

Adds Morgan, "Dan Trimble started part-time when he was 14. He's now a full-time employee, the foundation's webmaster and our computer guru. And he's just turned 20."

Alexander is a freelance writer in Edina, Minn.

Cloudy Future

School-to-work programs face two significant challenges – education critics and the impending loss of federal grants – that threaten their existence, says Katherine Hughes, senior research associate at Columbia University's Institute on Education and the Economy.

There is organized opposition to school-to-work programs from people who think high schools should focus on educational basics, not job training. Many critics fear that students are pressured to choose careers too early, Hughes says.

But Ruth Madalena *(madalena@wsv.org)*, program director of Workforce Silicon Valley, says IT companies will press ahead with school-to-work programs despite their critics. Workforce Silicon Valley is a private, nonprofit San Jose, Calif., organization that organizes high school and community college IT programs with firms such as Cisco Systems.

Another problem for school-to-work programs is that federal funding for facilitating agencies that help corporations set up school-to-work programs will expire in two years, and some agencies may founder for lack of support.

As a result, Workforce Silicon Valley has shifted away from a heavy dependence on federal grants. After two years in which it received $2.8 million in federal grants as well as $600,000 in private funds, the organization has shifted this year to $1.2 million in state funds and $300,000 or more in private money. "We're committed to raising enough money to sustain the program," Madalena says.

– Steve Alexander

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CONSORTIUM NOTES BENCH SERIES CERTIFIED RESULTS

Dear Career Adviser:

I'd like to know where I can find good salary information on the Web for permanent technical positions.
— CASH IN HAND

Dear Cash:

If you frequently look at salary information, you will soon see that salaries for high-tech people in general exceed those of the rest of the population. Furthermore, within high tech itself, there's a top tier for the anointed few that possess the latest, greatest electronic-commerce, Web, database and enterprise resource planning systems skills.

To find salary surveys, check out the Economic Research Institute's Web site (*http://204.203.220.1*), with about 200 surveys listed, and The LinkZone (*www.thelinkzone.com/salary.html*). There you will see a particularly good collection from Greensboro, N.C.-based Datamasters (*www.datamasters.com/survey.html*), where information is broken down by region and major IT job functions such as CIO, year 2000 manager or Web developer. Datamasters further labels each job function with a "Median Low," "Regional Median" or "Median High," plus a time line so you can see how salaries have progressed from 1990 to 1998.

Some interactive surveys, such as that from New York-based Pencom Systems Inc., (*www.pencomsi.com/industry.html*), require you to fill out information about yourself before you get the information, but check out similar interactive offerings with no such requirement at *www.washingtonpost.com* and *http://stylelive.com/techsalaries*.

And don't forget *Computerworld*'s annual salary survey — see the latest one at *www.computerworld.com/more*.

Dear Career Adviser:

I'd like to know about E-commerce jobs from a technical and management perspective, as well as understand the salaries in this field. What do companies look for in an E-commerce manager? Do I need an MBA or other degree to advance? Are companies looking at E-commerce managers to fill CIO positions in 2000? — E-COMMERCE CRAZY

Dear E:

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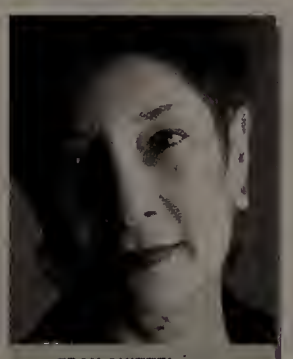

FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at **www.computerworld.com/career_adviser.**

Although certainly more jobs exist at technology levels than for top managers, managers need business and bottom-line experience.

You also will need to stay current about mergers, initial public offerings, acquisitions, the latest hot technologies and their implications for bottom-line revenues. So immerse yourself in reading material, conferences and coursework.

According to one electronic-commerce hiring manager, Frederick D. Lowe, director of development at www.mypoints.com, a service of MotivationNet Inc., an MBA with a bachelor's degree in computer science looks great on paper, but if the candidate has no commercial Web background from prior work experience, the knowledge gap is tough to bridge.

That, he says, is because electronic commerce now encompasses so many technologies, ranging from Web Servers, databases, multiple programming languages, multiple Internet protocols and so on.

Regarding salaries, Lowe comments that electronic-commerce managers can earn far more than IT managers.

In the Midwest, he says, depending on background, electronic-commerce salaries typically range from $75,000 to $125,000, with salaries a little higher ($25,000 more) on the West Coast, a little lower ($15,000 less) in the South and about the same on the East Coast.

But many electronic-commerce companies are also Internet start-ups, so look for between 10% and 50% of base pay in options or stock, and signing bonuses between 10% and 20% of base pay.

Check out *www.execunet1.com* and *The Industry Standard*'s Feb. 1 issue covering "What Internet Professionals Make," *www.thestandard.net*. Bottom line: This is one exciting field.

Dear Career Adviser:

My field is installing and troubleshooting networks, Exchange E-mail and telecommunications systems. I want to know whether I should go out as a consultant or stay within a company as an employee. Also, if I go out on my own, I don't want to place myself through contract brokers but prefer to get jobs directly. Is that possible? — ON MY OWN

Dear Own:

Going out on your own as a consultant is a little more complex than just deciding to do it, because there are many tax and legal considerations.

If you work through a contract broker, they put you on payroll and do all the paperwork so you usually avoid Internal Revenue Service audits questioning whether you're a contractor or an employee of your client company.

But often going out on your own is determined by whether you can generate enough revenue. A lot of independent consultants simply find that when they're involved in an assignment, they aren't looking for new business and that when one assignment ends, they have to hustle, which can be pretty stressful.

San Francisco-based David Arrants, whose business Carefree Computing Services offers computer network consulting, has been on his own for five years, getting new assignments by constantly talking to people.

"I make sure when I present to a potential client that I show them while I'm there that I can really solve one of their problems. It may take me a little longer to do this," he says, "but then they generally hire me to do the work."

Last but not least, if you're sure you don't want to work through brokers, when you post your résumé on newsgroups or job sites, be sure you convey that information clearly.

Otherwise, you will get a lot of broker calls that will just frustrate them — and you. ◗

WORKSTYLES

What It's Like to Work in IT at . . . Illinois Department of Corrections

Interviewee: Scott Lovdahl, a data administrator who helps manage a fast-growing database of inmate demographic data and digital photos.

Location: A converted seminary in Springfield, Ill. Other offices there include administrative, executive and the correction officers' training academy.

Office layout: Cubes with midsize walls. For any of the 30 to 40 programmers, help desk staff and administrators in the office to see one other over the cube walls, people must be standing.

Office environment: Cubes are decorated with photos and cartoons, and some people have (quiet) radios.

Special recognition: A "Grump of the Week" certificate used to be awarded to the office's grouchiest worker, but it hasn't been seen for a while.

Special activities: The old seminary's facilities include an aerobics room, a weight room and a large gymnasium where workers hold spirited lunchtime basketball games. An Elvis impersonator recently appeared to deliver birthday greetings to one office worker.

Dress: "Jeans and sport shirts mostly. But you dress up a little more when visitors are coming."

Visiting prison facilities: IT staff visit prisons, sometimes as often as once per month, to install or service equipment, which is located in a secure area. Minimum-security facilities are more casual and relaxed than maximum, Lovdahl said: "The first time you go into a maximum-security facility, it is intimidating – big gates slam behind you, everything is plain concrete, and sometimes the inmates holler at you. But when you've been a few times, you get used to it."

What to wear when visiting maximum-security facilities: "Don't wear jeans and a denim shirt. You might get mistaken for an inmate."

Quote: "People are interested in what we do because the general public doesn't get to hear about what a roundhouse looks like and what prisons feel like from the inside."

– Stewart Deck

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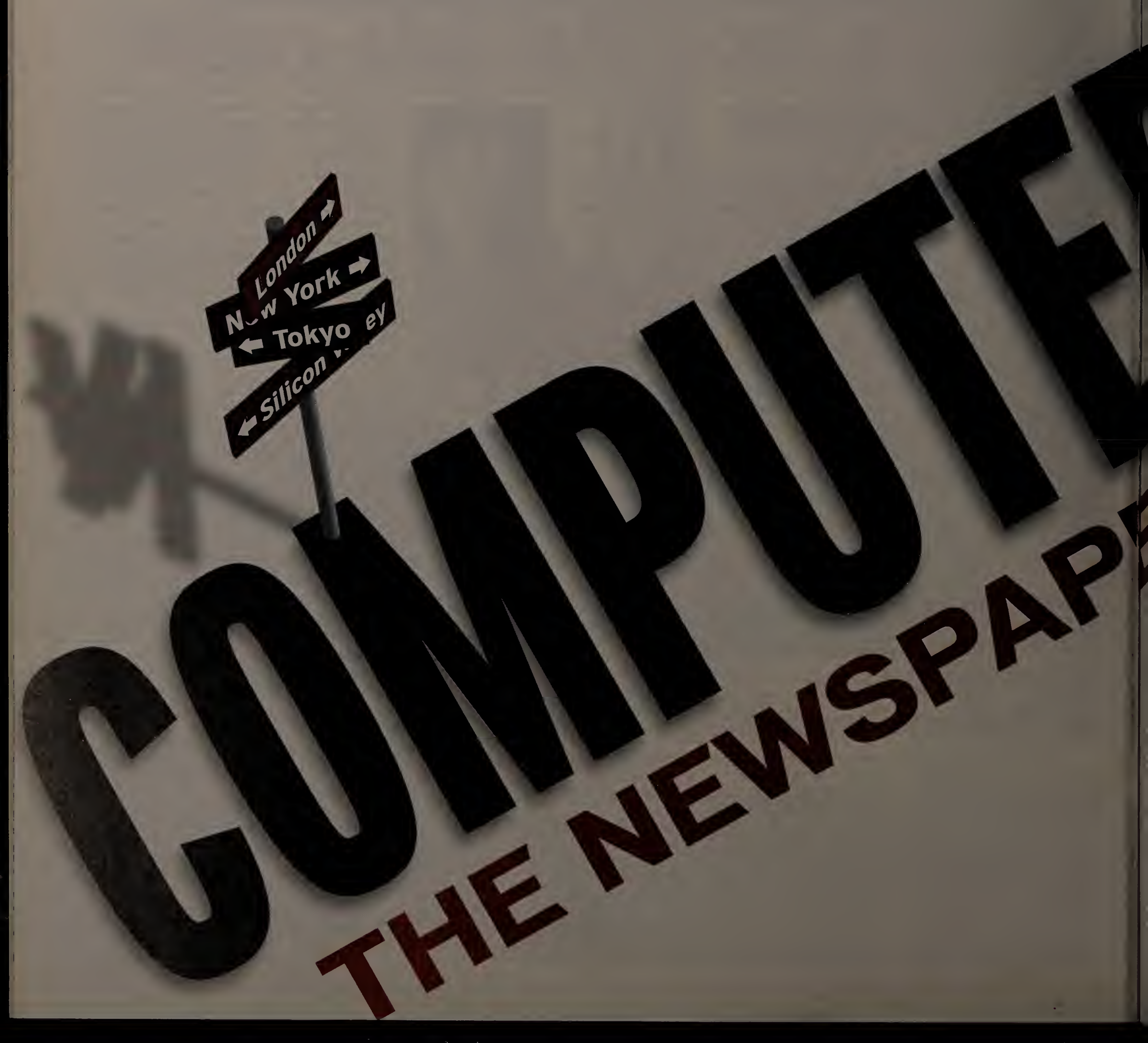

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TECHNOLOGY

MIDDLEWARE LINKS DATA

OpenLink Software has developed server-based middleware that, it claims, could more easily link the Web to popular databases. One of a new class of "virtual database engines," Virtuoso would eliminate the need to maintain database drivers on client PCs. ▸ 66

FINE-TUNING NT PRIVILEGES

Windows NT administrators are caught in a bind: Current versions of NT don't make it easy to fine-tune administrative privileges, Windows 2000 won't ship at least until the end of the year and there's a lack of third-party administrative tools. We look at how several customers are coping. ▸ 64

MULTIMEDIA E-COMMERCE

Users with E-commerce sites who want high-quality multimedia but don't want to struggle with crowded and unpredictable networks might try a hybrid approach: using a CD or digital video disc to supply streaming digital video and a Web connection for the E-commerce engine. ▸ 68

PLUG-IN ROUTER FOR NT SERVERS

Start-up Effnet Inc. has developed a Windows NT server plug-in card that allows servers to perform high-speed routing as well as some firewall functions. But analysts are skeptical because NT already provides some of these functions for free. ▸ 69

PROFILING JAVA APPS

Java profiling tools can help developers find trouble spots in their applications and then make the necessary changes to boost their performance. ▸ 64

FRANKLY SPEAKING

Few know what Microsoft's top-secret project (code name: "Cool") is, but columnist Frank Hayes weighs in on what it ought to be: an easy system for developers to design and generate big chunks of distributed applications automatically. ▸ 72

QUICKSTUDY: DCOM

Microsoft's DCOM lets pieces of applications work together across the Internet. We explain how DCOM works and how it differs from rival CORBA. ▸ 73

FLASHBACK: 1956

MIT developed the first programmable, general-purpose computer to use transistors. And Elvis appeared on *The Ed Sullivan Show*. Talk about a good year. ▸ 78

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KIRBY LAMBERT, technical director at MGI Studio: "Survival in our business depends on being able to do things your competitors can't"

REID HORN

FORMING A SAN PLAN

STORAGE-AREA NETWORKS (SAN) promise to be hot. The goal is centralized storage in a LAN, and users hope for heightened manageability and high availability of data. But the pieces of the SAN puzzle aren't on a solid foundation just yet: Standards are still forming, and the technology is still immature. Early users offer their implementation experiences and product choices in Field Report.

74

BRIEFS

Unicenter to Support Pentium ID

Management software vendor Computer Associates International Inc. and chip developer Intel Corp. have developed a tool kit to help developers write Unicenter TNG applications that use the processor identification in Intel's forthcoming Pentium III chips.

The tool kit will include application programming interfaces for third-party hardware and software vendors, as well as a unified console for status monitoring and integration of any managed object's processor ID number.

The tool kit is scheduled to be available on March 1 on both companies' Web sites.
www.cai.com or *www.intel.com*

Applet Allows Web-Page Edits

Mainstay Communications has announced JustEdit Plus, a Java applet that lets users edit Web pages using a Web browser. Users can change elements such as headlines, prices, dates or links using the applet's Web-based editing window.

That eliminates the process of starting a file transfer protocol application, downloading the file, starting a Web-page editor, making the changes, saving the changes and then re-uploading the file, according to the Camarillo, Calif., company.

Both a name and a password are necessary for read/write access to Web pages.

The single-user price is $99.95.
www.mstay.com

New Version Of Bean Server

Valto Systems Inc. has announced the latest versions of Ejipt, its embeddable Enterprise Java Beans application server. The updates include new samples and documentation for how to achieve container-managed persistence.

Pricing for the Ejipt server ranges from free for evaluation or noncommercial customers to $1,495 for a server that supports unlimited connections.
www.valto.com

MIDDLEWARE PROMISES TO EASE DATA TRANSFER

OpenLink's Virtuoso takes server-based approach to linking interfaces, databases

BY CYNTHIA MORGAN

A NEW "VIRTUAL database engine" that links diverse legacy databases through server-based middleware may solve one of IT's bigger headaches: providing uniform, direct Internet database access without swamping shorthanded technicians.

OpenLink Software Inc.'s Virtuoso can connect database interfaces such as Java Database Connectivity (JDBC), Open Database Connectivity (ODBC), DB-LIB and OLE-DB with Microsoft SQL Server, Oracle Corp., Computer Associates International Inc.'s CA-Ingres and other popular databases.

Residing on the server, it eliminates the need to install and maintain multiple database drivers on every client and could potentially increase performance and reduce the amount of technical support required to give users access to older or nonstandard database information.

Virtuoso will deliver uniform database services such as queries, replication and concurrency control across an array of different databases, said a spokesman at the Burlington, Mass., company.

Unified database interconnectivity isn't a new idea: Microsoft Corp.'s Universal Data Access (UDA) standard first was developed to tie together multiple versions of ODBC with newer OLE-DB applications. Sun Microsystems Inc. has promised similar interconnectivity with its JDBC Data Access standard.

UDAs have become an accepted "glue" for connecting one database to another, especially as Web applets increasingly need real-time access to older databases.

Disparate Formats

"Because we're a mature company, we've been collecting data for a long time," said Mike Jewett, manager of the Information Resources Group at Longs Drug Stores Corp. in Walnut Creek, Calif. "It's in all kinds of formats that range from DB2 on an ES-9000 mainframe to numerous smaller servers running Informix on Unix. And database connectivity is one of the biggest problems we have."

Translator

Virtuoso, currently in beta, extends the UDA model by interconnecting multiple types of databases and database interfaces.

Residing on the server, it receives queries from the client and translates them into the appropriate format for database access.

The process can be transparent to developers, who work with Virtuoso's logical database references, known as Data Source Names, without worrying about the underlying data structures.

"That ties in especially well with what we're finding out from our users," Jewett said. "They don't want self-serve applications that help you build your own queries; they want full-serve Web interfaces that deliver automated reports without delay. To achieve that vision, we need tools that allow us to quickly link these databases to our Web front end."

Jewett said Virtuoso's server orientation would serve large enterprises well.

"We generally prefer them [to client-based tools] because they're much easier to manage and usually offer a lot of power without a performance hit," Jewett said.

The package, scheduled to ship this spring, will support a variety of platforms, including Windows NT, Mac OS, OpenVMS, OS400, BSDI and popular flavors of Unix such as Linux on Intel Corp. boxes, IBM's AIX, Sun's Solaris and Hewlett-Packard Co.'s HP/UX.

Pricing starts at $99 for a single-client license and ranges to $15,000 depending on the number of servers, clients and concurrent database sessions supported.

A free, two-client version that supports 10 database sessions can be downloaded from the company's Web site (*www.openlinksw.com/*).

ORACLE'S DATABASE APPLIANCE

It may look like hardware, but the salient feature here is the database. Oracle Corp. introduced this "Raw Iron" idea – a hearty database running on a slim operating system – back in November and is still a little sketchy on details such as when it will be available. But Oracle has said a single-processor Intel-based system will sell for $7,500. Hewlett-Packard Co. is the first hardware vendor to sign on for the concept, shown here as a working model of an Oracle8i Appliance.
Hewlett-Packard
www.hp.com

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BRIEFS

Handheld Concerns

Problems associated with handheld computers

Employees have had trouble operating handhelds	44%
Incompatibility with other systems	42%
Power/battery problems	36%
Loss of data	27%
Software/application problem	27%
Damage to units	25%

Base: 85 IT professionals at companies with 100 or more employees; multiple responses allowed

SOURCE: COMPUTERWORLD IT INTELLIGENCE UNIT, FRAMINGHAM, MASS.

Rack-mount Servers

Tatung Science & Technology Inc. is shipping the Compstation 4400, a server with four 400-MHz UltraSPARC-II processors. According to the Milpitas, Calif., company, the server is available in both rack-mount and tower configurations and incorporates a Peripheral Component Interconnect bus. It comes preinstalled with Solaris 7 from Sun Microsystems Inc. Pricing starts at $37,570.

www.tsti.com

RAID Storage

MTI Technology Corp. in Anaheim, Calif., last week introduced the Gladiator 3500, a RAID data storage system designed for high-availability environments such as running online transaction processors, decision support or data warehousing. It features two 40M byte/sec. UltraSCSI ports per controller pair and up to 855G bytes of capacity per RAID configuration. Pricing ranges from $61,050 to $215,125.

www.mti.com

QPS Debuts Que

QPS Inc. in Yorba Linda, Calif., is shipping Que, a CD-rewritable drive designed for the iMac computer from Apple Computer Inc. With the drive, users can record, erase and rewrite CDs at double speed. It has 24-speed read capability. CD authoring software also is included. The drive costs $299.

www.qps-inc.com

WEB SITES PUT VIDEO ON DISCS

Local storage of bulky multimedia files avoids bandwidth crunch

BY NANCY DILLON

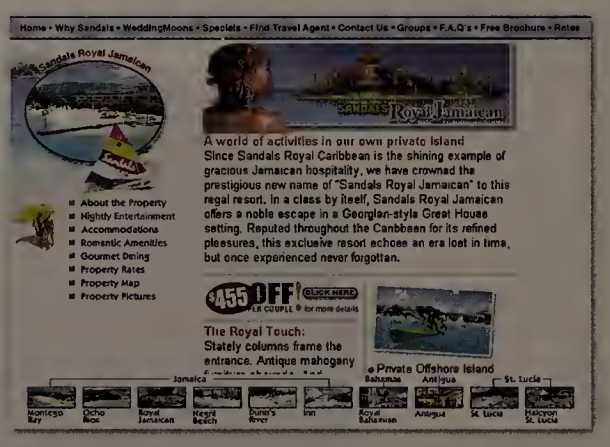
FORGET WAITING for enough Internet bandwidth to pump full-motion video out to Web shoppers. Companies like Trashy Lingerie now use multimedia CDs that offer broadcast-quality video and bring buyers straight to the check-out pages of their electronic-commerce sites.

Trashy Lingerie, a Los Angeles apparel retailer, added electronic-commerce capability to its Web site (*www.trashy.com*) three months ago. The site has plenty of static graphics, but no real multimedia to set it apart. To help meet the goal of making the site a bigger moneymaker than its famous L.A. store, officials decided to add a 20-minute CD movie featuring the company's apparel.

The CD is based on a proprietary database that can cue up targeted Web links while the video is playing.

"When you see an actress wearing something you want to buy, you just click on the button and it takes you to our shopping cart section," said Mary Loomis, director of Internet operations at Trashy Lingerie. "And rather than people aimlessly flipping through a lifeless catalog, the movie is going to hold their interest."

Loomis said the "PG-rated" movie has a scripted plot, professional actresses and several comic elements. Produced with SellOnstream Java software from San Carlos, Calif.-based ImaginOn Inc., it features MPEG-2 video and MPEG-1 sound. Trashy Lingerie plans to distribute 10,000 CDs starting in May.



BEING SEXY ISN'T ENOUGH: Accessibility is the key at the Sandals Resorts site, which uses multimedia CDs to help customers choose services

Such hybrid discs can drive more buying-oriented traffic to sites, improve transaction completion and generate leads, Gill said.

Trashy Lingerie isn't alone in trying out hybrid discs. Two weeks ago, Sandals Resorts (*www.sandals.com*) released an interactive vacation planner mastered with software from New York-based CDKnet.com Inc.

Less sophisticated than Trashy Lingerie's effort, the hybrid CD includes a 20-minute video tour of Caribbean destinations, some basic content created with HTML, the Internet programming language, and an animated presentation.

Links to Web

The CD has more than 10 "strategic" Web links embedded, said Bobby Stewart, vice president of systems development at the Miami-based tour company. These include links to package rate pages and dealer locators.

"It will definitely contribute to booked business," Stewart said. The company printed 100,000 copies and is mailing them to travel industry professionals, repeat guests and others by request.

Stewart said he also plans to gain market intelligence by tracking how his target audience uses the CDs.

"We plan to count the number of Web site sessions initiated by the CD and then look at which Web pages the CD customers tour," Stewart said.

Battle Brews Over Server Bus

60 more vendors join anti-Intel effort

BY JAIKUMAR VIJAYAN

An initiative by several hardware vendors to curb Intel Corp.'s control of system design is heightening the possibility of a major standards rift in the server industry.

At issue are competing efforts to develop an I/O bus design that can boost server performance significantly beyond Peripheral Component Interconnect (PCI)-based servers today.

For users, such a battle could mean component incompatibilities, product delays and getting locked in to different technology streams, analysts said.

Just last week, 60 new vendors allied themselves with Future I/O, which is backed by Compaq Computer Corp., IBM, Hewlett-Packard Co., 3Com Corp. and Adaptec Inc. Compaq declined to name the new vendors.

Intel's Next Generation I/O (NGIO) bus is backed by several vendors including Dell Computer Corp., Sun Microsystems Inc. and Siemens AG.

Big Gains

According to Karl Walker, vice president of technology and development at Compaq, Future I/O — to be available in 2001 — will offer significantly greater performance than NGIO and a severalfold performance increase over PCI. For instance, where PCI can move data between the CPU and peripherals at 132M byte/sec., Future I/O will be capable of more than 2G byte/sec., he said. Future I/O also will be fully compatible with PCI and the interim PCI-X technology, which is being sponsored by the same vendors.

In contrast, early versions of Intel's NGIO — which should become available early next year — are expected to start at around 156M byte/sec. to 312M byte/sec. and will be incompatible with PCI.

Intel has dismissed claims that Future I/O will be more powerful than NGIO. "They are talking about something that is going to become available in 2001 or 2002," said Bill Kircos, an Intel spokesman. "A lot of things can happen before then."

Compaq's Walker said he hopes Intel will join the Future I/O effort "and [help] to merge the two efforts into one." Intel's Kircos said the chip vendor hopes to attract Future I/O backers into its camp.

For Future I/O, a lot will still depend on how much Intel — as the industry's largest chip supplier — is willing to back the initiative, said Tony Massimini, an analyst at Semico Research Co. in Scottsdale, Ariz. "It won't fly if Intel isn't involved," Massimini said.

AT A GLANCE

Battling I/Os

What are Future I/O and NGIO? Both are server bus technologies to boost I/O performance.

Why is that necessary? Current PCI technology is simply not powerful enough to fully exploit Intel's fastest chips. Thus it has become a performance bottleneck.

How powerful are these technologies? PCI transfers data between the CPU and peripherals at 132M byte/sec. Both Future I/O and NGIO will boost that to well over 1G byte/sec.

Who is developing NGIO? Intel, Dell, NEC, Sun, Siemens, Hitachi and others.

NAVAL SCHOOL CHOOSES ATM FOR TRAINING NET

$5M backbone conversion improves bandwidth to desktops by factor of 20

BY MATT HAMBLEN

TWO YEARS AGO, the U.S. Naval Postgraduate School (NPS) in Monterey, Calif., ran a data network that sometimes crashed three times per day for hours at a time.

But in recent weeks it has fully converted its 2,500 students, teachers and other users to a new $5 million network based on an Asynchronous Transfer Mode (ATM) backbone with Switched Fast Ethernet to each desktop, school officials said. ATM often is more expensive than Gigabit Ethernet backbones for campus settings, analysts said.

Guaranteed Bandwidth

But at NPS, either solution would have cost about the same, and ATM will provide guaranteed bandwidth to meet the Navy's demands, said the integrator and consultant on the project, Doug Picard, president of International Automation Associates, also in Monterey.

"We needed to have multiple links from big buildings so that 800 to 900 simultaneous users could have live links, and [we] didn't feel Gigabit Ethernet could do that" as reliably as ATM, Picard said.

The school hopes eventually also to run its voice network over the ATM network and expand videoconferencing for classroom and distance learning, said Tom Halwachs, CIO at NPS.

The bandwidth to desktops has increased by a factor of 20, up to 100M bit/sec., allowing instructors to take full advantage of animation graphics which are viewed by students throughout the campus.

Before, the school lacked a real backbone, and ran a hodgepodge of shared Ethernet with two routers that delivered only 2M to 5M bit/sec. at the desktops, Halwachs said.

When the conversion was made, one oceanography instructor running an animation about ocean mining techniques asked to have the system slowed down because he was used to running the animation on the older, slower network, Halwachs said.

"He couldn't believe it was running that fast," he said.

DOUG PICARD (right) shows Naval Postgraduate School CIO Tom Halwachs some of the capabilities of the school's new ATM network

The new network uses nearly $2 million in 3Com Corp. equipment, including 14 ATM switches and 14 edge routers that allow 622M bit/sec. bandwidth on the backbone among 20 campus buildings.

Microsoft Corp.'s NetShow Theater Server is used to pump streaming video to desktops, and soon Intel Corp.'s ProShare will be employed for videoconferencing, Halwachs said.

Campus housing outside the backbone will be outfitted with 3Com cable modems so that students can study via cable TV connections.

Analysts said recent installations of ATM equipment in campus backbones are less popular than simpler-to-install and cheaper Gigabit Ethernet switching.

ATM components account for about 2% of network components worldwide, said Tom Nolle, an analyst at CIMI Corp. in Voorhees, N.J.

Nolle said ATM sometimes is preferable over a Gigabit Ethernet backbone when multiple network protocols are used over the same network infrastructure, as is the case at NPS. Ron Jeffries, an analyst at Jeffries Research in Arroyo Grande, Calif., said ATM offers the ability to guarantee bandwidth and quality of service.

"With Gigabit Ethernet, they just throw an enormous amount of bandwidth at a problem" without guarantees, he said. "But the ultimate choice between the two is more of a preference of those doing the integrating."

SNAPSHOT

Glad About FRADs

Worldwide frame-relay access device revenue

1998	$584M
1999	$706M*
2000	$812M*
2001	$888M*
2002	$951M*

*Projected

Note: FRADs are devices that concentrate data from sites onto wide-area frame-relay links.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

Start-up Offers Router-on-a-Card for NT

Faces uphill battle pitching IP-only device

BY BOB WALLACE

Although it sports a promising technology for speeding routing, start-up Effnet Inc. has its work cut out for it pitching its recently announced IP router-on-a-card for use in Windows NT servers.

That's chiefly because Microsoft Corp. has been offering IP and IPX routing with NT Server 4.0 and 5.0 since mid-1997 in an effort to eliminate the need for traditional hardware-based routers.

"They have interesting technology, but NT already does multiprotocol routing standard," said Michael Speyer, an analyst at The Yankee Group, a Boston consultancy.

Also, Wellesley, Mass.-based Effnet has yet to establish distribution channels to bring its product to market.

PCI-Bus Card

Nonetheless, Effnet claimed that its $2,500 Peripheral Component Interconnect-bus card incorporates an algorithm which supports routing at 400,000 to 500,000 packets per second, compared with the approximately 40,000 packets per second claimed by Microsoft.

Effnet said it has developed and enabled the device to route at high speeds and perform firewall filtering.

But, unlike Microsoft's offering, Effnet's product doesn't support IPX, which still is used in many companies.

Initially, it ships with only a T1/E1 wide-area network interface, and there are no plans for lower-speed interfaces used at smaller sites.

Effnet said the card will ship by July with a chip that performs encryption and IPsec security support.

BRIEFS

Vector Graphics Standard Drafted

The World Wide Web Consortium, which oversees Web technical standards, has released its first public draft of a proposal for scalable vector graphics.

With scalable vector graphics, Web designers could post graphics on the Web in vector form and not have to convert them to current Web-acceptable formats such as JPEG or graphics interchange format. The proposed standard was written in the Extensible Markup Language (XML) and marks a first step in attempting to use XML for cross-platform Web graphics.

www.w3.org/Graphics/SVG/

Web Server, App Monitoring Tool

Freshwater Software Inc. has announced SiteScope 4.0, Web server and application monitoring software for both Unix and Windows NT.

The Java-based software has a uniform resource locator transaction monitor feature that verifies whether online electronic-commerce and database transactions are executing properly from beginning to end. It can check user downloads of frames, graphics and text during each step of the interaction. The new version also adds remote monitoring for Unix.

Pricing for licenses starts at $495 for NT and $1,295 for Unix.

www.freshwatersoftware.com

Device Offers Frame-Relay Access

Northern Telecom Ltd. has announced Passport 4455, a frame-relay access device designed for consolidation of multiple connections from branch offices.

According to the Brampton, Ontario, company, the central switching node can integrate data, telephony, fax and other traffic types over a single connection.

It has five slots and offers a new cascading capability that helps users save on distance-based line costs.

Pricing starts at $4,900.

www.nortelnetworks.com

Going 'Soft' on Taxes

BY DAVID ESSEX

IF YOU'RE TAX-OBSESSED like me, few challenges fascinate you more than reducing, to the legal minimum, the pound of flesh that must be mailed annually to the Internal Revenue Service. To keep sharp, you need to plan tax strategies all year — and there are few more affordable ways than dipping into Intuit Inc.'s TurboTax or Block Financial Corp.'s Kiplinger TaxCut long after that Form 1040 has been sent.

If you're used to paying an accountant to worry about such things as estate planning and tax shelters, tax software might not be worth the trouble. But if you're not sure you're getting the best advice or if your commercial tax preparer makes too many mistakes for your comfort, it's time to take taxes into your own hands. These packages provide both the knowledge and tools you need to confidently manage your taxes.

Most people use tax software only to prepare their annual taxes. The Big Two (TurboTax and TaxCut) make that tedious process so undeniably easy that it's a slam-dunk decision to buy one or the other every year (you need to get the right forms and calculations).

Both use basically the same approach. Their entry-level packages extract the needed information in plain-English forms and checklists, then fill in the IRS forms — visible at the bottom of the screen — as you go. Calculations occur in the background, and hyperlinks provide quick answers to frequently asked questions. The Deluxe versions have all this plus electronic books and short videos, which always are well-done and informative. Additional CDs hold the forms unique to corporations. Naturally, electronic filing also is right at hand.

A mostly settled technology, tax software is nonetheless evolving in Web-typical ways, with more online tax preparation — the Big Two offer it, and sites run by Universal Tax Systems Inc. (*www.securetax.com*) and Thomson Investors Network (*www.onetax.com*) are dedicated to it. Web updates (for last-minute IRS changes) and greater personalization also are growing.

I used TurboTax and TaxCut (both deluxe and small-business versions) and an upstart, 2nd Story Software's TaxAct '98, to calculate my 1998 taxes, judging each on ease of tax preparation and educational value. ◗

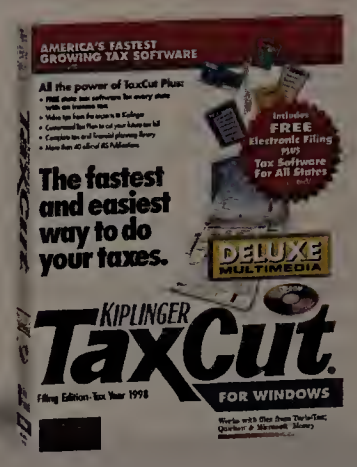
Essex is a freelance writer in Antrim, N.H.

KIPLINGER TAXCUT

Deluxe multimedia version for Windows
Block Financial Corp.
www.taxcut.com
$39.95 (street price; Macintosh version available)

Kiplinger TaxCut is so close to TurboTax in style and function that its maker, Block Financial, takes pains to point out the differences.

TaxCut's list prices for basic and deluxe packages are $10 cheaper than those of TurboTax. But that's splitting hairs; TurboTax is often deeply discounted in store promotions. The real savings come in state filings: TaxCut Deluxe bundles forms for all states for free, while TurboTax charges $27.97 for one state and $19.95



for each additional state. You will save if you have recently moved, if your spouse works in a different state or if you have kids in out-of-state colleges. As advertised, TaxCut has simpler screens that are easier to navigate than TurboTax. But I found its spare design to be a bit stale-looking. I also faulted both for presenting too many cryptic messages about loading and saving files.

One of my favorite features is the long, detailed tutorial on real estate. TurboTax can't touch it for thoroughness, though overall I found TurboTax's videos, tips and references to be better presented than TaxCut's. New this year in TaxCut: a simplified tabbed interface, the state-tax deal, two interview tracks (one each for neophytes and experienced filers) and free online preparation and filing of Form 1040EZ at *www.taxcut.com*.

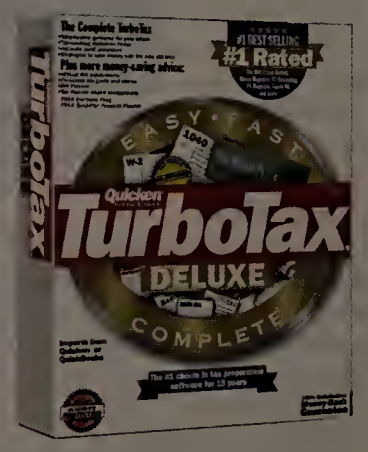
TURBOTAX DELUXE

Intuit Inc.
www.turbotax.com
$49.95 (suggested retail price; MacInTax Macintosh version also available)

TurboTax remains the king of tax programs, more than doubling TaxCut's sales. I tried both the Deluxe and the $69.95 Home & Business versions; the latter is for sole proprietors.

This year's biggest change is a "Smart Interview" system that uses your financial profile to determine which forms you need. I found the process indeed was quicker than last year's. TurboTax also combats disorientation by keeping an index of interview steps on screen with part of the associated form.

Both TurboTax and TaxCut can stumble on routine housekeeping and navigational chores. TurboTax, for example, showed a "Save File to Disk?" message that didn't make clear which file it was talking about or why I needed to save



that particular screen. Neither program makes it obvious where you left off when you close and later reopen the program, a drawback I haven't investigated in TaxAct '98. The result is the uneasy feeling that previous work hasn't been saved, you're duplicating or copying over a previous session – or you're in the wrong section entirely.

Overall, I slightly prefer TurboTax over TaxCut because of its more on-target expert advice. It appeared more likely than TaxCut

to pop up with the tips you need when you need them and boasts more Weblike – although sometimes confusing – screens.

TAXACT '98

2nd Story Software Inc.
www.taxact.com
$9.95

TaxAct '98 is a decent little program that has economics against it. It duplicates the woody, reassuring comfortableness of TurboTax and TaxCut well enough and goes beyond interviews, forms and calculations with what-if scenarios, a "Life Events" module for gauging how milestones such as marriage and college affect your taxes, and general tax advice. There's even a freeware version, but it lacks the other packages' frills and doesn't come with an accuracy guarantee, which is standard with the Big Two.

My problem with TaxAct '98 is that the $10 to $20 saved compared with a sale copy of TurboTax or TaxCut is hardly enough to risk the larger amount of money at stake. Better to pay a bit more and get familiar with a program you may be sticking with for years to come.

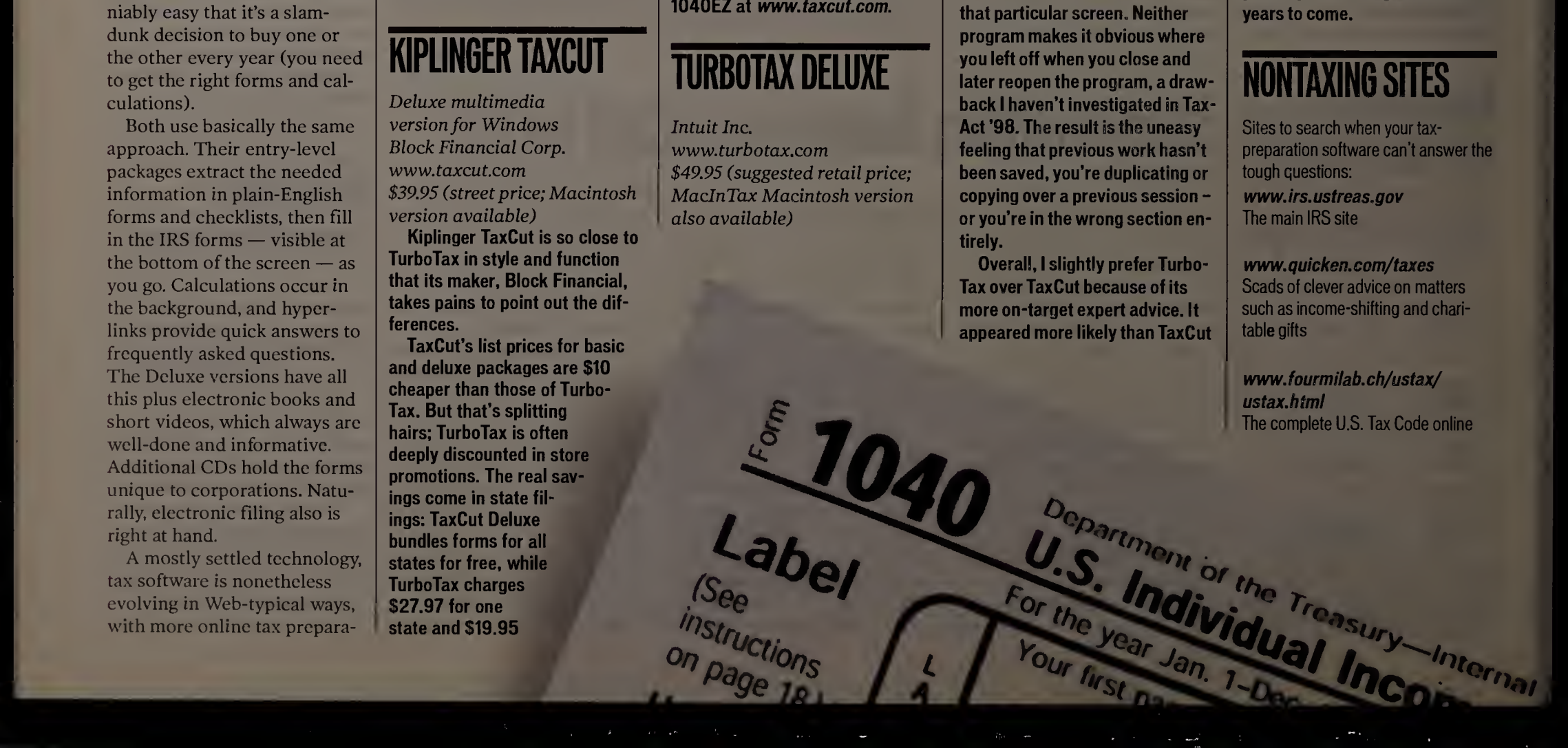
NONTAXING SITES

Sites to search when your tax-preparation software can't answer the tough questions:

www.irs.ustreas.gov
The main IRS site

www.quicken.com/taxes
Scads of clever advice on matters such as income-shifting and charitable gifts

www.fourmilab.ch/ustax/ustax.html
The complete U.S. Tax Code online



"It's easy to sit down and crank out thousands of words of well-behaved analysis, but IT and business leaders just don't have time to sift through all the rhetoric. What they really want is strong, punch-through opinions, sharp analysis. As a columnist, I'm going to be there pounding the table and waving my hands. I'm going to get in your face. I'm going to say it loud and clear, but I'm not going to be unfair. I'm always rooting for the business people who actually buy and use information technology. I want to know what's getting in their way, where's the pain. I want them to get home for dinner more often. I want them to win."

The Ultimate Fan

Frank Hayes, Columnist

COMPUTERWORLD

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Read Frank Hayes in Computerworld. To subscribe, call us at **1-800-343-6474** or visit www.computerworld.com.

BRIEFS

This Hal Is a Supercomputer

Star Bridge Systems Inc. (SBS) last week claimed that it has created the first computer capable of performing 12.84 trillion calculations per second. The Salt Lake City-based company said its HAL-4RW1 Hypercomputer system (nicknamed – what else? – "Hal") began operating Jan. 29. According to SBS, Hal is the fastest supercomputer in the world for most tasks, knocking off IBM's Blue Pacific. IBM might take issue with the claim, though; a source close to IBM said, "This is not an apples-to-apples comparison."

HP Expands Vectra Line

Hewlett-Packard Co. last week added two models to its Vectra PC line, the Vectra VE and the Vectra VL, both based on Intel Corp.'s Celeron and Pentium II processors. According to HP, the machines feature a more compact design, quieter operation and an easy-access chassis. An HP Vectra VE PC with a 400-MHz Pentium II, a 4.3G-byte hard disk, 32M bytes of synchronous dynamic RAM and Windows 95 costs $1,196. A Windows 2000-ready Vectra VL PC with a 400-MHz Pentium II, an 8.4G-byte hard drive, 64M bytes SDRAM and Windows NT costs $1,337.
www.hp.com

CanOpener For Windows

Abbott Systems Inc. has started shipping a Windows version of CanOpener, its universal file opener that was previously only for the Macintosh platform. According to the vendor, CanOpener 1.0 for Windows lets users search and retrieve text from most PC files, including damaged files. It costs $39.
www.abbottsys.com

Smart-Card Partnership

Schlumberger Ltd. and the University of Michigan's Center for Information Technology Integration have announced a partnership to study smart-card technology. Researchers will investigate using the cards for remote Internet services, electronic commerce and access authorization.

According to the university, the focus of the research will be enhancing data security using smart cards.

Japan's MITI Plans Net Device

Japan's Ministry of Trade and Industry (MITI) and the parent company of Sega Enterprises Ltd. are said to be inviting Japanese computer vendors to build a low-priced consumer terminal for accessing the Internet.

Under the plan, the companies would build Internet and video phone functionality suited for home users into Sega's Dreamcast game console. The console would be activated by voice commands and remote control and would be easy for nontechnical consumers to use, sources said.

Fridge Takes On Microwave

Scandinavian appliance maker Electrolux AB plans next week to show a prototype of a refrigerator that will let users order goods over the Internet. Codeveloped with UK-based International Computers Limited PLC, Screen Fridge has a touch-screen display, a browser and a bar-code scanner for automating the grocery list.

Electrolux said it plans to launch the Screen Fridge this year. NCR Corp. announced a microwave oven with many of the same features last September.

FRANKLY SPEAKING/FRANK HAYES

What is Cool?

SO IT TURNS OUT Java is dead meat at Microsoft — or maybe not, depending on what report you read last week. According to various sources, Microsoft plans to license a Java clone and build its products around that. Or possibly kill its Java products completely. Or conceivably create its own new Javalike language.

Confused? So is everybody else, apparently. But the one thing all the reports agree on, from trade newspapers to *The New York Times*, is that Microsoft is working on, well, something code-named Cool. Cool may be Microsoft's Next Big Thing. It may be a new language, though Microsoft denies that. It may be Javalike or a replacement for Java. (In these news stories, Microsoft seems obsessed with Java.)

But no two descriptions of Cool are quite the same.

Nope, I don't know what Cool is, either. But based on history, technology and what corporate IT shops actually need, we can make some pretty good guesses about what Cool isn't — and what it really should be.

First things first: What Cool won't be is a head-to-head competitor of Java. Microsoft doesn't win head-to-head competitions with savvy competitors. Remember Microsoft Money? And the Microsoft Network? And even Internet Explorer, before it was stitched into Windows 95? Microsoft won't win by playing catch-up with Java.

No, Microsoft wins by leapfrogging the competition and leveraging the technology it builds in to its operating systems. That's how Microsoft Excel took the spreadsheet market away from Lotus 1-2-3 and how Microsoft Word stripped WordPerfect of its word processor dominance. When Windows took over PCs, 1-2-3 and WordPerfect were left in the dust.

A new Javalike language? Forget it. But what about a language that does some things Java can't do? What if, instead of a traditional programming language, Cool turns out to be an object-oriented modeling system — one designed to make it easier to build distributed, transaction-based applications?

Right now, building real distributed systems is very, very hard. So hard, most shops don't even try. A language or tool that makes it easy — now that's something IT shops need.

What Microsoft's top-secret project could, or should, be.

Funny thing, too — that's also the kind of new technology Microsoft is building in to its next version of Windows. Windows 2000's Active Directory will make it far simpler for distributed applications to find their way around the network. COM+, another highly touted Windows 2000 feature, is supposed to radically simplify transaction programming and make middleware obsolete.

All that's missing is an easy way for developers to design and generate big chunks of distributed applications automatically — a modeling system that would do for distributed programming what Visual C++ did for building graphical applications.

Is that the mysterious Cool? If it isn't, it ought to be. It's what corporate IT shops need. It would give us a huge boost in creating distributed systems — and, not incidentally, would give IT shops a real reason to want Windows 2000.

Of course, it won't be Java — or Javalike, or a Java replacement. It won't even make Java obsolete. But unless Microsoft truly is obsessed with Java, there's no reason it should be.

We don't need another Java — and neither does Microsoft. What we need is a better way to build distributed applications. And that really would be cool. ◗

Hayes, Computerworld's staff columnist, has covered IT for 20 years. You can contact him at frank_hayes@computerworld.com.

Distributed Component Object Model

BY FRANK HAYES

Allowing pieces of an application to work together across the Internet requires reliable and secure connections — as well as a special system for directing program traffic. Since the early 1990s, two groups have vied to develop the most effective way of meeting those needs.

One, the Object Management Group (OMG) in Framingham, Mass., is a coalition supported by IBM, Sun Microsystems Inc. and other vendors. In 1991, OMG developed a distributed computing architecture called Common Object Request Broker Architecture (CORBA), which is used by many large organizations for enterprise-scale distributed computing with Unix servers and proprietary mainframes [CW, Oct. 5, 1998].

The other is Microsoft Corp.'s Distributed Component Object Model (DCOM), which is built in to Windows NT 4.0 and Windows 98.

DCOM has the advantage of being "incredibly easy to use," says Karen Boucher, an analyst at The Standish Group International Inc. in Dennis, Mass. If programmers write their Windows applications using ActiveX, Microsoft's way of writing components [CW, Aug. 10, 1998], the operating system will automatically create connections and direct traffic between components — whether they're on the same machine or not.

On top of DCOM's ability to link components, Microsoft added features related to Windows, including the Microsoft Transaction Server — for performing database transactions across the Internet — and the forthcoming COM+, which will further simplify distributed programming with features such as in-memory databases.

But there are disadvantages to DCOM. "It's still a Microsoft-only solution, really," Boucher says. DCOM started on Windows, and Microsoft cut a deal with Software AG of North America Inc. to port DCOM to non-Microsoft platforms. But, Boucher says, that work is largely outdated because of Microsoft's enhancements to the Windows version of DCOM.

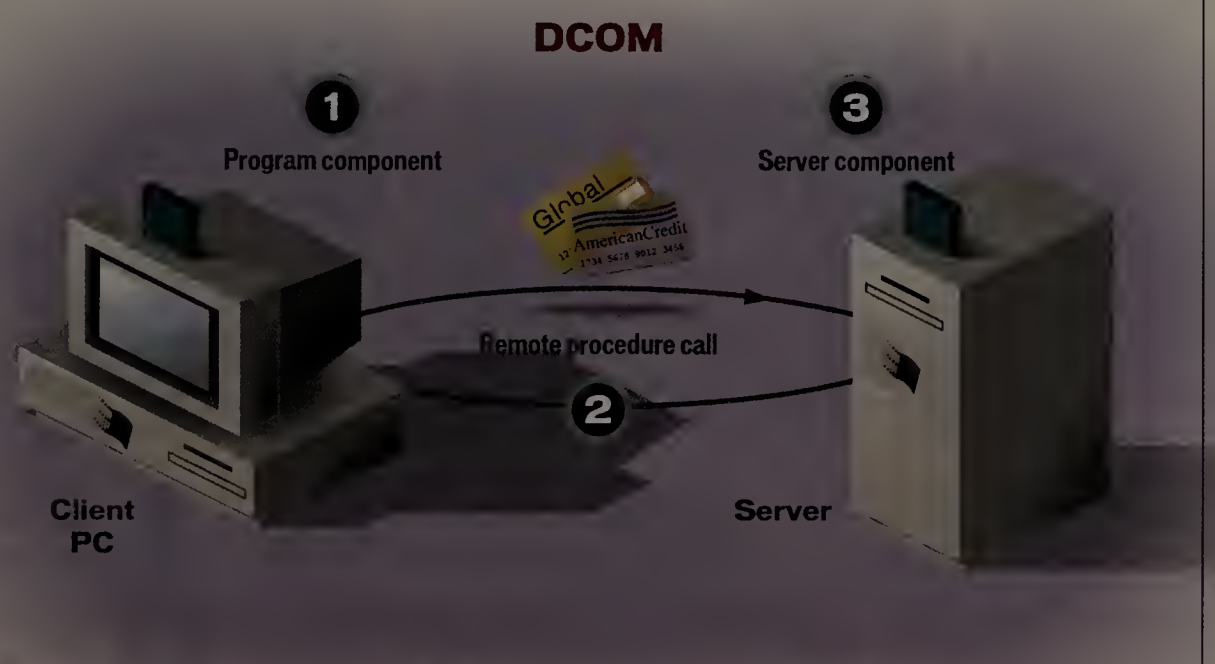
Another downside is that DCOM was designed to use Microsoft's Active Directory, a networkwide directory service, to find components on the network. But Active Directory won't be available until Windows 2000 ships. For now, DCOM must use local component lists, making it impractical for anything larger than a workgroup application because if a component's location changes, that change must be manually updated on every system on the network.

But analysts at Forrester Research Inc. in Cambridge, Mass., predict that once the pieces are in place, 70% of large companies will eventually choose DCOM as their main platform for building strategic business applications.

DEFINITION

Distributed Component Object Model (DCOM) is Microsoft's system for spreading an application across more than one computer on a network. A software component on one machine can use DCOM to send a message called a remote procedure call to a component on a different machine. DCOM automatically sets up the connection, carries the message and returns the reply from the remote component.

How DCOM Allows Components to Communicate



1 Program component on the client PC makes a function call to a remote server component, such as a credit-card verification system via the Windows operating system.

2 DCOM sets up a connection across the network between the two components using remote procedure calls.

3 The program component can communicate with the server component as if they were on the same machine.

MOREONLINE

For more information on DCOM, visit our Web site.
www.computerworld.com/more

DCOM vs. CORBA

Both Microsoft's DCOM and the Object Management Group's CORBA support distributed computing. But they have developed in different directions.

DCOM

Microsoft expanded DCOM by including transaction services, easier programming and improved support for Unix and other platforms.

CORBA

The OMG has expanded by adding industry-specific support for telecommunications, manufacturing, electronic-commerce, financial, medical, transportation and utility companies.

Related terms

Active Directory: Microsoft's forthcoming network directory system, slated to be part of Windows 2000.

ActiveX: Microsoft's system for developing software components.

Component: One piece of a distributed computing application.

Common Object Model (COM): Microsoft's system for developing applications using components.

COM+: An enhancement to COM and Microsoft Transaction Server that simplifies complex distributed-computing development.

Common Object Request Broker Architecture (CORBA): The major competitor to DCOM for distributed computing systems.

Distributed computing: Applications in which different parts of a program may be running on separate computers on a network.

Microsoft Transaction Server (MTS): An enhancement to COM that adds database transaction support.

Remote procedures call (RPC): A message sent across a network that allows a program on one computer to start a process on another computer.

■ *Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to QuickStudy editor Stefanie McCann at stefanie_mccann@computerworld.com.*

SAN

REID HORN

ARE WE THERE YET? No — at least not to the fully realized vision of storage-area networks (SAN). Pieces of the SAN puzzle still are missing because standards are either immature or nonexistent. However, there are ways you can install a SAN today if you're careful and, like many IT department managers, you're willing to risk a proprietary solution.

That's right — proprietary. It isn't often that you hear analysts advocating proprietary systems or users showing little fear of investing in them, but that's the SAN market today. Proprietary systems, such as those from Compaq Computer Corp. and 3Com Corp., are the safest and most sensible option if you need SAN performance, according to industry experts and information technology managers who have dabbled in SANs.

The alternative to the proprietary approach is to piece together a SAN yourself, but you really may be hanging the corporate data out to dry. Too many vendors found their own way to interpret the Fibre Channel standard — the SAN data transport protocol of choice — so incompatibility among devices remains a major problem when building your own.

Proprietary SANs are tested, vendor-prequalified systems that analysts say are safe to buy into even before the official standards are ratified. They're safe because the systems are adaptable to the standards when finished. Also, companies truly in need of a SAN's performance run more of a risk by not moving forward now and waiting for standards to firm up,

IT check

Early storage-area network users talk about immature technology and implementation issues

By Kevin Burden

says Mark Fereli, an analyst at Strategic Research Corp. in Santa Barbara, Calif.

MGI Studio, a prepress studio in Dallas, often finds its network strangled by the 1.5G-byte files with which it typically works. "Survival in our business depends on being able to do things your competitors can't," says Kirby Lambert, technical director at MGI. "When our SAN is installed and someone asks if we can do animation rendering in-house, I can take the job."

Rendering requires expensive Silicon Graphics Inc. workstations; the proprietary SAN from MicroNet Technology Inc. in Irvine, Calif., that MGI will install in the next year will give it the flexibility to lease workstations when they're needed. Because all systems on a SAN have access to the same data, "it's very easy for us to swap specialized systems in and out as jobs come and go," Lambert says.

Retailer Spiegel Inc. also feels it can't delay its SAN implementation much longer. Analysts at its data center in Westmont, Ill., are more concerned about backing up 9T bytes of storage than about the lack of approved SAN standards. "If we thought the interoperability standard would be out any time soon, maybe it would be worth waiting for. But we can't put this off any longer," says Keith Odom, senior systems analyst.

Spiegel chose to build a SAN for its Unix servers instead of installing a prequalified system but is moving forward only with proven tools. It will install a Fibre Channel hub this year so the company's servers can back up to all of its tape drives. Once management tools catch up and do a better job of mapping individual drives to specified servers, Spiegel administrators plan to link all disk drives to the SAN hub, Odom says.

Some administrators often are willing to risk deploying proprietary SANs because the biggest interoperability risks so far lie with system interconnects, typically the easiest upgrades in a SAN, Fereli says. Hubs and switches generally house the system's intelligence and run the highest risk of not fitting the ratified standards. Moreover, although today's SANs are necessarily proprietary, most come from vendor alliances that have agreed on how their products will integrate until the official standards are finished.

For instance, 3Com so far has partnered with Data General Corp.'s Clariion Advanced Storage Division in Westboro, Mass., and MTI Technology Corp. in Anaheim, Calif., for storage devices and with Palo Alto, Calif.-based Legato Systems Inc. for its management software. When you package those offerings with 3Com's own Fibre Channel products, a qualified end-to-end SAN is born.

But is that proprietary? "Technically, yes," says Carolyn DiCenzo, principal analyst at Dataquest in San Jose, Calif. "But its different parts are based on open standards, so you're not entirely locked down, either." Given the slow progress of SAN standards to date, there's a good chance these proprietary systems will become default interim standards that heavily influence the final official versions. "Get a big-enough community together, and that is how stan-

SAN, page 76

WHAT IS A SAN?

A storage-area network (SAN) is a dedicated network that connects all the servers and clients to a shared pool of storage devices. The pool consists of servers, external storage devices, hubs and switches, and network and storage management tools.

SANs increase the availability of data by letting any server on the network access any storage device on the SAN. Server performance also is increased as storage-intensive processes such as backup and recovery are offloaded to the SAN. SANs also promise lower cost-of-ownership through centralized management.

Gigabit-speed Fibre Channel has emerged as the transport protocol of choice for SANs; it allows disk and tape storage devices to be attached to multiple hosts. Interfaces such as Escon also can be used, but Fibre Channel is preferred for the 10K distance it supports between nodes.

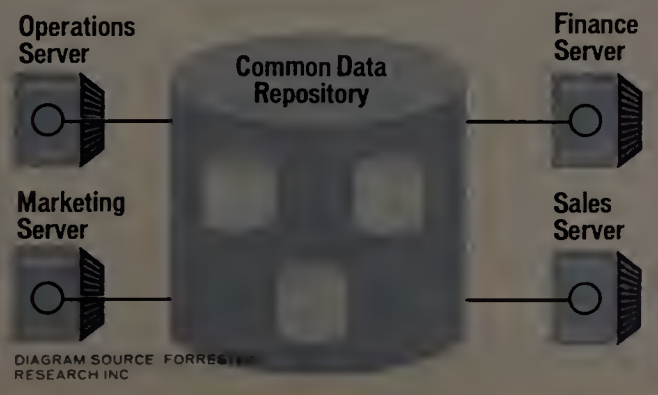


DIAGRAM SOURCE FORRESTER RESEARCH INC

Continued from page 75

dards get stuffed down associations' throats," DiCenzo says.

It will be several years before the Storage Networking Industry Association (SNIA) finishes standardizing the management aspects of SANs. It will finish specifications that will let management software manipulate drives, switches, hubs and so on this year. "But the larger discussion, on how all the devices are managed as a whole, is just coming to the table," says Brad Stamas, an analyst at Storage Technology Corp. and an SNIA member. "So, standards by de facto? I expect some parts will show up that way."

Because the vendors aren't waiting for the standard interfaces to fully bake, neither should users, says Andres Lofgren, an analyst at Giga Information Group Inc. in Cambridge, Mass. "We are years away from having these standards completely addressed, and there are plenty of other benefits users can get from SANs today that override what these standards will eventually deliver," he says.

That's exactly the mind-set of Bob Cornelius, product manager at SunGard Recovery Services, a disaster recovery service in Wayne, Pa. The promise of complete interoperability — being able to plug in any storage device from any vendor — certainly has its appeal, "but I can wait for that," he says. "Besides, Compaq certifying that its SAN system will work is more valuable to us than total connectivity ever would be."

SunGard is installing the underlying Fibre Channel fabric called for by Compaq's Enterprise Network Storage Architecture (ENSA). With ENSA, the onus of compatibility is on Compaq alone.

"We've set these systems up. They don't have the 'plug in anything' connectivity of a network like some users may want, but we've proved they will work and [we] guarantee their performance," says Mark Lewis, Compaq's director of engineering. Compaq is first delivering systems for Microsoft Corp.'s Windows NT on servers from Intel Corp., Sun Microsystems Inc.'s Solaris, Hewlett-Packard Co.'s HP-UX and SGI's Irix. Systems for Novell Inc.'s NetWare, The Santa Cruz Operation Inc.'s UnixWare and NT on Alpha will follow in the second quarter.

Cornelius manages what amounts to a square city block of storage, 18T bytes. The business of disaster recovery means you need to support clients who are on the cutting edge and those using older technologies.

"A SAN will give us the storage on demand we need to do that more efficiently," Cornelius says. SunGard first will network its UltraSCSI drives Compaq has qualified, and "eventually we will swap out all our drives for new Fibre Channel drives as they become available," he says.

Compaq also has taken steps to assure ENSA-based SANs can evolve as Fibre Channel technologies mature. Its systems support Fibre Channel switched fabrics, the successor to Fibre Channel Arbitrated Loop that's at the base of most SANs today. Comparing them is like comparing Ethernet with Switched Ethernet: The latter is a high-end system that extends the architecture with better performance and increased reliability.

Lambert knows what it's like to be handcuffed to a SAN that won't evolve with the latest technology. Five years ago, MGI Studio installed one of the earliest renditions of a SAN. It comprises two 9G-byte drives on a dedicated fiber network and delivered a respectable data speed of 2.5M byte/sec. "But we're totally locked down with it because it only uses Fast SCSI2 drives," Lambert says.

The vendor also took too long before committing to build Fibre Channel products, so Lambert began looking elsewhere.

Lambert turned to MicroNet Technology, which offered FibreFlex, a Fibre Channel-based SAN that would use his existing Ultra SCSI2 drives. The solution meant Lambert could increase his throughput with Fibre Channel while working with a safety net on proven SCSI drives. So far, FibreFlex at its best churns at 50M byte/sec., just half the performance Fibre Channel can deliver when optimized. "But nothing is more important than our data. I'm willing to sacrifice a little speed now to guarantee our livelihood," Lambert says.

FibreFlex was based on open technologies. As are the manufacturers of proprietary SANs previously mentioned, MicroNet is qualifying all the components until the standards are set. Eventually, FibreFlex will evolve into a pure Fibre Channel SAN with native Fibre Channel RAID controllers and drives and 100M byte/sec. speeds. ◗

MOREONLINE

For more information and resources on storage-area networks, visit our Web site.
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COMPARING TRADITIONAL STORAGE WITH SANS

ARCHITECTURE	TRADITIONAL APPROACH	SAN VISION	SAN BENEFIT
Connection	SCSI, Escon	Fibre Channel	Improves throughput 2.5 times to 100G bytes
Location	Servers and storage must be co-located	Servers and storage can be separated up to 6.2 miles (10km)	Enables centralized administration and disaster recovery
Storage Device	Dedicated to a server	Shared among servers	Improves resource utilization
Storage Management	Platform by platform	Across platforms	Lower cost and better scale
Server/Storage Relationship	Storage requests consume server cycles	Minimal server involvement	Server performance unaffected by storage tasks

SOURCE: FORRESTER RESEARCH INC., CAMBRIDGE, MASS.

FAST FACTS

WHAT THE FUTURE HOLDS

ANDRES LOFGREN
Giga Information Group Inc.
Cambridge, Mass.
The year 2000 will be a much bigger year for SAN implementations than this year. I expect growth to accelerate at a much faster pace in 2000, partially because interoperability and management standards will be further established and for reasons totally unrelated to storage, like Y2K and installing Windows 2000.

TOM LAHIVE
Storage Networks Inc.
Wellesley, Mass.
SANs will open the market to a couple of storage outsourcing options within the year. Some corporations will begin locating all of their storage at one central facility where it can be accessed by their geographically-dispersed divisions.

There also will be new companies that do nothing but establish data bunkers and sell clients access just to the storage capacities they need. This is true storage outsourcing, where companies buy access to their data rather than buy the storage equipment themselves.

NEWS CLIPS

LEGATO SYSTEMS INC. announced that it has signed a definitive agreement to acquire Intelliguard Software Inc., which produces standards-based storage management solutions for SANs.
– Business Wire, Jan. 28

GADZOOX NETWORKS INC. announced Ventana SAN Manager Version 2.0, which will provide higher availability, optimized performance and increased resiliency.
– Business Wire, Jan. 25

MICRONET TECHNOLOGY INC. announced FibreFlex, a multiplatform-compatible Fibre Channel storage area network solution that enables fast data throughput.
– Business Wire, Jan. 25

NETWORK APPLIANCE INC. and BROCADE COMMUNICATIONS SYSTEMS INC. announced a technology partnership to develop storage networking architectures integrating both SAN and network-attached storage environments.
– Business Wire, Jan. 25

COMPAQ COMPUTER CORP. announced StorageWorks offerings, building on its industry-leading enterprise network storage architecture designed to make computer storage a more flexible, shared resource throughout the enterprise.

Based on a comprehensive set of industry-standard technologies, the new products achieve breakthroughs in performance, scalability and disaster-tolerance capabilities.
– Business Wire, Jan. 25

COMPUTER ASSOCIATES INTERNATIONAL INC.'s ARCserveIT 6.6 Enterprise Edition leverages Fibre Channel to provide streamlined backup services. Enabling ARCserveIT Enterprise Edition 6.6 to run on Fibre Channel is the Enterprise Library option, which was released late last year and costs $1,200 (The ARCserveIT software costs $700).

The inherent advantages of Fibre Channel over SCSI include the ability to network storage devices over longer distances and to put a greater number of devices on a network. – *PC Week*, Jan. 25

STORAGETEK [STORAGE TECHNOLOGY CORP.], SCH TECHNOLOGIES and **TRILLIANT GROUP** announced worldwide workshops on SANs. Industry analysts forecast that SAN technology will increase the level of centralized data storage and help solve storage-related problems across the enterprise.

The free workshops will be held in major cities throughout North America, followed by workshops in Europe, Australia and Singapore. SAN technology is currently receiving considerable attention within the storage industry, but many organizations do not yet understand the benefits and/or impacts of SAN on the future of their organizations.
– Business Wire, Jan. 19

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Technology Happenings

A **U.S. district court** makes a final judgment on a 1952 complaint against **IBM** regarding monopolistic practices. The company signs a consent decree that places limitations on the way it conducts business with respect to "electronic data processing machines," among other things.

The **first trans-Atlantic** telephone cable is developed.

Ampex Corp. perfects the **first videotape recorder,** which is rapidly adopted by the television industry because, unlike film, the electromagnetic tape requires no processing.

Thomas Watson Jr. becomes CEO of **IBM**.

IBM founder **Thomas Watson Sr.** dies.

Bell Labs develops prototype of the first **picture phone.**

Jay Forrester's patent is issued for magnetic core memory.

Noam Chomsky invents context-free grammar, which is used in nearly all programming languages after its initial use three years later to describe Algol 60.

Born in 1956

Stephen Biko, South African civil rights activist

Larry Bird

Carrie Fisher, "Princess Leia"

Mae Carol Jemison, first African-American woman in space (1992)

Other Notables

Best Picture: *Around the World in 80 Days*

Woody Guthrie composes "This Land Is Your Land"

Top Record: Elvis Presley's "Don't Be Cruel"

Median price of a house is $14,500.

BY LESLIE GOFF

A LITTLE-KNOWN computer came out of MIT's Lincoln Laboratories in 1956 that wouldn't be well-remembered as the years went by, and yet its legacy reverberates more than 40 years later.

The TX-0 was the first programmable, general-purpose computer to dispense with vacuum tubes and rely on transistors and the first to test the use of a large magnetic core memory. More important, it was the first fully interactive computer available for wide use, one that inspired creativity that spawned some of the century's most important technological advances: computer graphics, Smalltalk, the Internet — all were developed by TX-0 alumni.

TX-0 users also laid the groundwork for more significant developments: digital recording and editing, speech recognition, handwriting recognition and neural networks.

"It helped train a generation of students in the hands-on, real-time interactive use of computers," says Wes Clark, who then was associate director of the Advanced Development Group at Lincoln Labs.

Clark worked on the project with Kenneth H. Olsen, who later would take ideas descended from the TX-0 and build the PDP-1, Digital Equipment Corp.'s first computer. Olsen was the engineer, Clark the system architect. Clark says he put together the TX-0's design over a single weekend.

"A simpler machine has probably not been built or used since," says Clark, who now works as a consultant to government and industry.

"Utter simplicity was the overriding goal. It would have to be considered a RISC machine in current terms because it was so primitively simple."

What was truly special about the TX-0, from a user's perspective, was a light pen — which Clark invented — and display that let users enter data in real time and see a direct result. An early demonstration of the TX-0's interactive capabilities was an amusing program, developed by Doug Ross and John Ward and called Mouse Maze, which depicted a mouse going through a maze. When the mouse made a correct turn, it drank a martini; along the way, it became increasingly inebriated.

Mouse Maze was just a dim foreshadowing of the innovation to come after the TX-0 moved from Lincoln Labs to MIT's Research Laboratory of Electronics. From 1958 to the mid-'60s, students could sign up for an hour or two of time with the TX-0.

"This was very different than previous computers where you had a noisy room with a card reader and people just picked up their cards and left and had no interaction," recalls Jack Dennis, who oversaw the lab and wrote several programs that improved the TX-0's operation. Students would hang out in the lab, waiting for a turn at the console. "Everyone would look over each other's shoulders and could talk about what was going on. It was just a fun community," Dennis says.

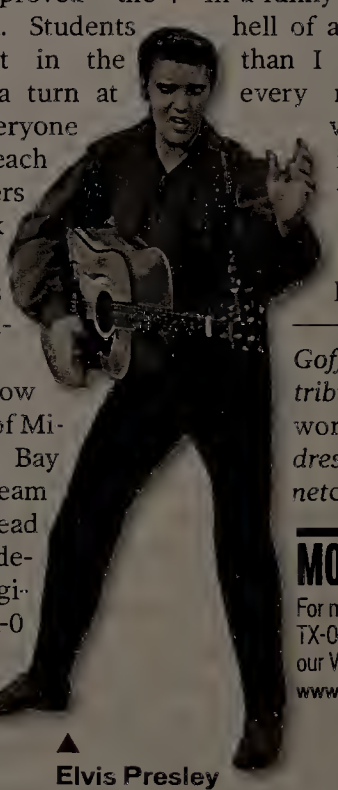
Gordon Bell, now a senior member of Microsoft Corp.'s Bay Area Research Team and earlier the head of research and development at Digital, used the TX-0 to work on speech recognition, which led to a technique that's still a cornerstone of the technology.

"Anyone who used the TX-0 knew they wanted to work on interactive systems," Bell says. "In a funny way, I don't feel a hell of a lot different now than I did then. I think every morning when I wake up that there is something really wild and new and exciting to do that, in 50 years, will look just as wild." ◗

Goff is a frequent contributor to Computerworld. *Her E-mail address is lgoff@ix.netcom.com.*

COURTESY OF MIT ARCHIVES

A scene from *Saga*, a Western written by the TX-0 with the help of programmers D. H. Morse and Doug Ross



THE ASSOCIATED PRESS

MOREONLINE

For more information on the TX-0 and its alumni, visit our Web site.
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1956

University of Alabama students riot against court-ordered admission of the first African-American student.

Martin Luther King Jr. is arrested for the first time. His home is bombed four days later.

U. S. detonates the first aerial hydrogen bomb.

Prince Rainier of Monaco marries actress Grace Kelly.

Fifty-one people die on the Italian liner *Andrea Doria*, which sinks off the New England coast.

The Soviet Union crushes workers' uprising against communist rule in Hungary.

Elvis Presley appears on *The Ed Sullivan Show*.

Suez Canal Crisis: Israel invades the Gaza Strip and Sinai Peninsula; British and French troops attack Egyptian forces around Suez.

Japan is admitted to the United Nations.

JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

■ Flashback is produced with the assistance of the Computer Museum History Center in Mountain View, Calif.

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BRIAN O'MALLEY
Everest & Africa Adventurer

BARBARA STOKER
Business Consultant & Technical Rock Climber

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SUSAN HODGES, SEMCO ENTERPRISES

The Recruiter's Role in Retaining Talent
BARBARA MITCHELL, THE MILLENIUM GROUP

Perception is Not Just Everything, it's Everywhere
FRANK CUTITTA, INTERNATIONAL DATA GROUP

Immigration Update
HARRY JOE, ESQ., JENKENS & GILCHRIST

I.T. Retention Metrics Best Practices
DAVID WELDON, COMPUTERWORLD

Cutting Edge Tools for the Internet Recruiter
BRET HOLLANDER, NETRECRUITER

Using a P/L Approach to I.T. Recruiting
DAN HANYZEWSKI, MASTECH

Electronic Recruiting: Trends and Drivers
JOHN SUMSER, INTERBIZNET.COM

Defending the Fort
JOE ANDREWS, PROGRESS SOFTWARE

Attracting, Retaining, and Engaging I.T. Talent Using Non-Traditional Benefits
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With a lengthy background in high tech careers and recruiting, Computerworld's CareerAdvisor Fran Quittel specializes in providing in-depth information for job seekers and a "Recruiting Scoreboard" to help employers audit and improve their internal recruiting practices. Fran is author of the book *Firepower: Everything you need to know before and after you lose your job* and is the original creator of The FirePower Career Forum on The Microsoft Network. She also publishes career advice at www.careerbabe.com and tips for employers at www.yourcareer.com

Ask Computerworld's CareerAdvisor

This new feature will appear every other week starting January 11th and is Computerworld's interactive career advice column. Simply submit your questions to Computerworld's CareerAdvisor at **http://www.computerworld.com/career_advisor** and yours might be answered in the print and online pages of Computerworld by nationally recognized columnist Fran Quitell.

COMPUTERWORLD CAREERS
The Newspaper for IT Leaders

Health Care Industry Rx

Doctors' orders include IT workers skilled in networking, systems integration and large packaged applications

By Leslie Goff

WHETHER called upon to develop a browser-based front end to a patient-care system or an interface from the patient-care system to billing applications, everything that the information technology team does in a health care facility touches patients.

Two technology trends prevail: The use of large, shrink-wrapped packages and integration of myriad systems and platforms across hospitals and clinics.

Most hospitals are dependent on at least one industry-specific vendor, such as Shared Medical Systems Corp. (SMS) or Medical Information Technology Inc. (Meditech), for major applications.

A look at three distinctly different hospitals — an academic health care center, a large urban medical center and a mid-size regional hospital — reveals the breadth of skills in demand and opportunities available.

E.H. COLQUHOUN

Johns Hopkins Medicine

Location: Baltimore
Facilities: More than 3,000 beds across five different medical centers, hospitals and special clinics.
Web site: *hopkins.med.jhu.edu*
IT human resources liaison: Jim Hedeman, administrator, information services

What Looks Good on a Résumé: "Shared Medical Systems is our leading vendor, and we need to have people on our staff who are capable of securing the value from that particular application, and [have] the ability to link platforms that are totally different."
Technical Skills Wanted: Unix systems administration, Visual Basic, LAN administration, database management, Digital Equipment Corp. Alpha, mainframe, SMS and systems integration.
Attitude/Aptitude: "Probably 90% to 95% of our recruiting is not health care-specific. Most of the time we are looking for IT skills, and we don't care whether they were acquired in another health care business or in another industry. On the other hand, we recently employed someone who had nursing experience in an intensive care setting and also has an IT background. We're installing a new point-of-care system that will be used by nurses and doctors to care for intensive care patients, so we think this person is a good hire and will be very beneficial to the way we are applying this system."
Diagnosis: "Hopkins is an academic medical center, so we are not the typical community hospital. We have patient care, research and teaching, and we have a number of different systems and approaches that we use. . . .

"It's a multifaceted environment and we have taken a best-of-breed approach, [compared with] the [single-vendor] approach taken by many community hospitals."

Methodist Health Care System

Location: Houston
Facilities: 1,500 beds in four facilities, a Home Health agency, several joint-venture physician groups and a health maintenance organization called MethodistCare Health Plan.
Web site: *www.methodisthealth.com*
CIO: Bernie Minard, senior vice president, IT

What Looks Good on a Résumé: "Experience using our packages. The movement here is toward having an integrated delivery system, and there are two core areas to that: the Enterprise Master Person Index, which is typical of organizations that are integrating patient record-keeping, and the electronic Medical Record."
Technical Skills Wanted: Systems integration, interface development, clinical systems, legacy systems, desktop, infrastructure and Web-based applications development.
Attitude/Aptitude: "Ability to do well-defined, analytical, complex work."
Diagnosis: "It's typical in health care now to have hospitals that are acquired or merged, and then you have other affiliations and partnerships between large clinics and hospitals. All of these require integration of patient record-keeping. So maybe one has software from vendor A and another has software from vendor B. And maybe a patient is 'ASMITH' in one place and 'Al Smith' in another, and you have to bring all these things together."

In addition, there are doctors who work in private offices, the hospital and in a clinic. "If your systems aren't well-integrated, [they have] to learn several different user interfaces and passwords. So you have to integrate for the physician who would be so confused [that] he couldn't benefit from the automation because it would take him 10 minutes each time to get reoriented to a different system."

Conway Regional Medical Center

Location: Conway, Ark.
Facilities: 117 beds, eight clinics, fitness center and home health care.
Web site: *www.conwayregional.org/standard/index.phtml*
Chief technology officer: D. K. Martin, director of MIS

What Looks Good on a Résumé: "We use Meditech software and it's a legacy system. We have no object code on-site, and we depend on [Meditech] for all of our systems, so that directs us down a particular path. We need someone who knows as much about the Meditech applications as possible, and those fall into two arenas: One group operates on DEC Alpha machines, and another group — which we will have to migrate to — is client/server-based."
Technical Skills Wanted: Meditech; network design, analysis and administration; Windows NT and Windows 98; DEC Alpha and client/server.
Attitude/Aptitude: To communicate with nurses and doctors, "medical knowledge and networking knowledge are mandatory. To address that need, we are [launching] a health care industry master's degree program at a local college. We plan to hire one of their early graduates next year."
Diagnosis: "We are a not-for-profit hospital. We're under pressure from the federal government to reduce our Medicare payouts. At the same time, [Blue Cross/Blue Shield of Arkansas] told us that we'll be reimbursed less this year than last year, due to managed care. . . . We write off about 49% of our gross due to nonpayment, and that makes it extremely hard on our bottom line. It limits what we can spend on salaries and training." ◗

Goff is a freelance writer in New York. She can be contacted at lgoff@ix.netcom.com

Salary Transfusion

Average total compensation (salaries plus incentives) are lower than the compensation of other nonmanufacturing industries:

TITLE	SALARY
Director, IS operations	$64,375
Network administrator	$49,521
LAN manager	$55,940
Sr. programmer/analyst	$54,808
Programmer/analyst	$43,433
Computer operations	$52,577
Lead computer operator	$31,269
Computer operator	$27,146
Help desk operator	$32,800
PC technical support	$31,800

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- BAAN
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- Experience with installation and support of DB2, TCP/IP, Advantis links, and networking

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Client Server Analyst II. Modify computer software and systems by utilizing Visual C++, C, SQL and accompanying development tools in HP/UNIX environment to meet client needs and specifications. Provide consulting services for the design, development, testing, implementation, maintenance and enhancement of software packages and applications. Assist clients in evaluating and analyzing computer system needs. Requirements: Bach's degree in Comp. Sci., Engin, Math, or Information Systems and either one yr of exp. In job offered or one yr of exp. in a software and/or system analysis and/or design position. The one yr of exp. must include programming in C language on UNIX platform. 40 hrs/wk, M - F, 8:00 am - 5:00 pm. Salary: $48,464 per year. Apply to the AR Employment Security Dept., 1223 W. 7th St., Little Rock, AR, or send two resumes to: David Hayes, P.O. Box 2981, Little Rock, AR, 72203. Ref. Job Order #959956.

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Programmer Analyst, Westford, MA; Design, develop, implement Network management software based on RMON-MIB and UDIP/IP, SNMP Protocols. Test tools for Graphical User Interface based application, PC based Message Switching System. Develop software in C/C++, Prolog, Lisp. Provide technical support. Req'd. Bachelors in Comp. Tech. or Comp. Sci. or Physics or Math. 2 years exp in job offered or 2 yrs exp as a Systems Engineer. 40 hrs/wk., 9a-6p., $64,000/Yr. Applicants should submit two (2) copies of his/her resume in response to: Case #80881, P.O. Box 8968, Boston, MA 02114.

Senior Software Engineer (ST. Louis, Mo): Lead project teams in full lifecycle software development, including design, development, testing, implementation, documentation and maintenance of client server applications for financial reporting of corporate spending activity, with emphasis on object-oriented application and design, and utilizing object-oriented design methodologies, Visual Basic, Visual C++, Install Shield (International version), BML, Crystal Reports, Access and Oracle database systems. Develop procedures and tools to facilitate process improvements in all phases of software development lifecycle. Contribute to development of staff training programs. Requires Master's or equivalent in Comp. Sci., MIS, Math, Engg, or Statistics. (Employer considers a Bachelor's degree in any of major fields of study listed, + 5 yrs. of related progressive work exp. as equivalent). Must have 1yr. experience in job offered or 1yr. as Software Engineer/ Developer, including 1yr. exp. doing full lifecycle software development on client/server systems, using object-oriented design methodologies, Visual Basic,Visual C++ and Oracle. M-F; 8:00-5:00; $68,500/yr. Send resume in duplicate to: Job#140531, Mrs. J. Baston, Division of Employment Security, 13131 New Halls Ferry Road, Florissent, Mo 63033.

Lead Software Engineer-Deerfield Beach, FL. 40 hr/wk, OT varies, $60K/yr. Position reqs Master's in Comp Eng/Sci & 2 yr exp in job offd or 2 yr exp as comp analyst, prgmr or tech. Research, dsgn & dvlp comp s/ware systms in conjunction w/h/ware product dvlpmt for medical, industrial, military communications, aerospace & scientific applics; applying principles & technqs of comp sci, eng & math'l analysis; analyze s/ware reqmts to determine feasibility of dsgn w/in time & cost restraint; consult w/h/ware engrs & other eng staff to eval interface b/w h/ware & s/ware, & operational & performance reqmts of overall systm; formulate & dsgn s/ware systm using scientific analysis & math'l models to predict & measure outcome & consequence of dsgn, dvlpg & directing s/ware systm testing procedure, prgmg & documentation; consult w/customer re: maintenance of s/ware systm; may coordinate installation of s/ware systm; supv other s/ware engrs & deal w/upper mgmt decision re: budget & cost analysis. Must have knowl of Visual C++, Visual J++, VB, Java, Neuro Shell, Visual Interdev, C, C++, Basic, Cobol, Assembler Lang, MS Proj, & X-Math Visual Math Analysis. Send resume to Dept of Labor/ Workforce Prgrm Support, PO Box 10869, Tallahassee, FL 32302, Attn: S. Rosier, RE: JOFL#1911315.

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Also looking for **PROGRAMMER/ANALYSTS** with a Bachelor's & 2 yrs. of exp. in analysis, design, development, implementation & maintenance of software applications in the above listed areas. Candidates must be willing to travel & relocate. Send resume to: Recruitment CWW, Infotech Consulting, 3461 Market St., Ste. 303, Camp Hill, PA 17011 fax: 717-731-9857; e-mail: vyohn@icibsl.com. Visit our web site at http://www.icibsl.com

Senior Software Engineer (St. Louis, Mo): Lead project teams in full lifecycle software development, testing, implementation, documentation and maintenance of a three-tier client/server global information delivery and communication architecture system. Utilize knowledge of C/C++, Visual C++, SQL, Pro*C, TCP/ IP and socket programming, Sun/ Solaris UNIX and Windows 95/NT operating systems, and Oracle database systems. Under take web-based development using HTML, Java and scripting. Requires Master's or equivalent in Comp. Sci., MIS, Math, Engg. or Statistics. (Employer considers a Bachelor's degree in any of major fields of study listed, + 5 yrs. of related, progressive work exp. as equivalent). Must have 1 yr. as Software Engineer/ Developer, including 1 yr. exp. doing full lifecycle software development on client/server systems, using Oracle, TCP/ IP, SQL. C/C++, Pro-C and socket programming, as well as Java and scripting. M-F; 8:00-5:00; $65,000/yr. Send resume in duplicate to Job#140513, Mrs. J. Baston, Division of Employment Security, 13131 New Halls Ferry Road, Florissant, MO 63033.

SOFTWARE ENGINEER to develop and maintain applications and databases by evaluating clients' needs, analyzing requirements and developing software systems following design specifications using software languages and product.,;: C, C++, IBM RS6000, DOS, SQL Windows, Informix on Windows, UNIX (AIX, Sun, I HP, Oracle, (SQL Plus, SQL Loader, PL/SQL, Pro*C), Sybase, Shell scripts, MotifXLib, Borland C++ and Visual Basic. Require: M.S. in Computer Science and one year's experience in the job offered or as Programmer/ Analyst. Salary: $60,000 per year, 40 hours/week, 8:30 am to 5:30 pm, M-F. Mail resume (Ref KN99) to: R, Lynn Howard, Manager, Human Resources, Talus Solutions, Inc,, 4751 Best Road, Atlanta, GA 30337.

LAN Administrator - Design, support & implement PC/Data Access Control System (PC/DACS), Domain DACS & Netware 4 (with Netware IP). MUST HAVE: Bachelor's Comp. Sci., Engineering or Electronics Technology. 1 yr, 6 months exp. in job offered or 1 yr, 6 months as Network Analyst or Network Engineer. Exp. need only involve PC/DACS. Bachelor's degree may be substituted with 3 yrs of coursework & an additional 3 yrs of exp. 9-5, 40 hrs/wk, $45K. Submit a resume to: Bureau of Workforce Program Support, PO Box 10869, Tallahassee, FL 32302-0869. Job location: Boca Raton, FL.

ORACLE DEVELOPER
Seeking an energetic self-starter for our Oracle Developer position.

Responsibilities incl: designing, programming, implementing & supporting Oracle RDBMS applications for UNIX & Windows.

Requirements: Oracle, SQL, UNIX & Windows. BS in CS, Math, Eng'ng, or related & 2yrs in Database Development using Oracle. Competitive salary & benefits offered.

Resumes to HR Dept/Horizon Computers, Inc.
Attn: Dr. Kaushik Sengupta
5 Lincoln Highway
Edison, NJ 08820
Ph. (732) 603-0004
Fax: (732) 603-0066
resume@horizoncomp.com
(use ASCII text or Winword file)

Application Analyst Programmer I: Design & develop application programs to perform statistical analysis in NT Windows and UNIX environment; design & write algorithms when statistical procedures in SAS,BMDP, SPSS etc. are not applicable. Write & provide doc. for SW design & analysis. Req: MS in C.S or Statistics, resume to Director of Statistical Computing, CSCC, Univ. of NC, Dept. of Biostatistics, Ste 203, Nations Bank Plaza, Chapel Hill, NC 27514. EOE

PROGRAMMER/ANALYST to analyze user requirements and design, develop, implement, maintain and support application software for various clients using VAX C, VAX/COBOL, Pro-COBOL, ACMS, DEC Forms, VAX Rdb and ORACLE in a VAX/VMS environment. Require: B.S.in Computer Science/Engineering, or a closely related field, with one year of experience in the job offered or as a Systems Analyst. Extensive travel on assignment to various client sites within the U.S. is required. Salary-. $60,000 per year, 8 am to 5 pm, M-F. Send resume to: Raghavendra Kulkarni, President, Pro Softnet Corporation 6525, The Corners Parkway, Norcross, GA 30092; Attn: Job TP

SOFTWARE ENGINEER (2 positions) needed F/T by IT Services Co. in Plainsboro, NJ.

1.. Must have 2 yrs exp analyzing, dsgn & dvlp comptr applics using ORACLE, Designer 2000, Developer 2000 (Oracle Forms, Report Writer) in a Novell Netware envrmt. Master in Comp Sci, Comp Engg or Electrical Engg reqd.

2.. Must have 2 yrs exp dsgng, dvlpg coding, testing & implmtg finan'l applics using Lotus Notes, ORACLE, Forms & Pro*C. Masters in Math, Comp Sci or Comp Engg reqd.

Send resumes to: H. R. Dept, Infinix Corp, 666 Plainsboro Rd., Ste 1320, Plainsboro, NJ 08536

Bridge Technology Software Architect wanted by Co. involved in Bridging S/ware Products in Boston, MA. Must have BS in Comp Sci; knowledge of Win NT Server, COM/DCOM, Win NT Service & C++ Directory Services and 1 yr exp in dvlpmt of bridge s/ware. Respond by resume to: HR Dept., Corechange, Inc., 260 Franklin St, 18th Flr, Boston, MA 02110.

Sr. Software Engineer needed F/T by Remote Access Technology Co. in Bedford, MA. Must have Bachelors in Comp Sci or Comp Engg and 2 yrs exp in s/ware dvlpmt for LanRover, LanRover Access Switch & OEM platforms. Respond by resume to: Job Code EM500, Shiva Corp., 28 Crosby Drive, Bedford, MA 01730.

Programmer/Analyst needed F/T by IT Co. in Union, NJ. Must have 2 yrs exp dvlpg Lotus Notes w/Notes applics; analyzing, dsgng, dvlpg & implmtg new work flow applics. BS degree req'd. Respond to: HR Dept., Patel Consultants Corp, 1525 Morris Ave, Union, NJ 07083.

Programmer Analyst wanted F/T by Software Products Dvlpmt Co. in Manh. Must have 2 yrs exp dsgng, dvlpg, testing, implmtg & supporting Client/Server and multi-tiered applics using JAM v.5.7 dvlpmt tools incl ReportWriter, w/Sybase or Oracle RDBMS, C and structured CASE tools in UNIX and MS Windows envrmts. Bachelors in Comp Sci, Comp Engg, Electronics Engg or Math req'd. Respond by resume to: JYACC, Inc, H.R. Dept, Attn: John Campbell, 116 John St, New York, NY 10038.

Programmer Analyst needed F/T by IT Co. in Union, NJ. Must have 2 yrs exp, as Lotus Notes administrator, deploying, installing, configuring & providing end user support. BS degree req'd. Respond to: HR Dept., Patel Consultants Corp, 1525 Morris Ave, Union, NJ 07083.

Systems Analyst needed by NJ Computer Services Co. for job location in Middletown, NJ. Must have 6 mos exp devising & implmtg computerized acctg systms to incorporate EDI, invoicing, vendor managed inventory & mfg. Bachelors in Acctg, Economics or Business req'd. Respond to: HR Dept., H & L Technique, Inc, 11 Chestnut Drive, Colts Neck, NJ 07722.

Programmer/Analyst needed by NJ Computer Services Co. for job location in Middletown, NJ. Must have 1 year exp in system and n/work admin for UNIX; RDBMS admin incl rebuilding files & index files as well as security controls. Bachelors in Comp Sci, Comp Engg or Elect. Engg req'd. Respond to: HR Dept., H & L Technique, Inc, 11 Chestnut Drive, Colts Neck, NJ 07722.

Technical Editor, Japanese Software Products, wanted by Research & Dvlpmt Co. in Boston, MA., to manage conversion of Co.'s engg s/ware from English to Japanese using desktop publishing applics. Masters in Computer or Linguistics and 3 yrs exp in translating/editing in technical field req'd. respond to: HR Dept., Invention Machine Corp., 200 Portland St, Boston, MA 02114-1722.

Programmers/Engineers needed. Several senior level positions available for qualified candidates possessing MS plus relevant experience or BS with 5 or more years overall computer experience. Work with Powerbuilder, Oracle, Sybase, Informix, C and C++. Extensive travel and relocation as needed. Fax resume to Computer People, Attn: HR Dept. 412-434-3639.

Programmer/Analyst needed F/T by Computer Services Co. in Edison, NJ. Must have 1 yr exp planning, dvlpg, testing & documenting computer applics using SYNON/ 2E and RPG/400 on AS/400 platform. Bachelors in Comp Sci, Comp Engg or Elec. Engg. req'd. Respond by resume to: HR Dept., Horizon Computers Inc, 5 Lincoln Hwy, Edison, NJ 08820.

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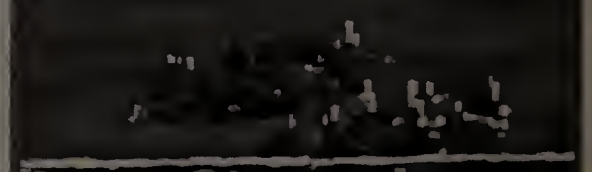

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Programmer Analyst (Unix Networking/Sys. Admin. & Sys. prog.) Install customize & fine tune performence of operating sys, on heterogeneous pletforms. Achieve connectivity of workstations using networking technologies. Perform sys. configuration mgmt. for both h'dwere & s'tware. Provide user support & network troubleshooting Services. Carry out performence tuning of applicetion packages such as Reletionel Database Mgmt systems (RDBMS) under Unix operating system. Manage TCP/IP besed services such es NFS, NIS, TFP, TELNET, etc - Perform network mgmt. using SNMP & releted tools. Ensure fault tolerent printer services & back-up mgmt. procedures, utilizing knowl. of Installetion of WAN connectivity w/heterogenous h'dware platforms using routers &/or gateways over leased & dedicated circuits. Using knowl. of Internels on operating sys. for patching & coding device drivers & network progrmig using IP/IPX, TLI, Streams & SOCKETS. Req: Bachelors degree in comp. sci.- meth/engr'g/sci./bus. (commerce) (or equiv.) & 1 yr exp in job or as software engineer/ systems enelyst. Must have appropriate combination of skills as follows! I of A & 2 of B or 1 of D; or 1 of A & 2 of B & 2 of C; or I of A & 2 of C & 2 of D es follows: A)Operating Sys.: IBM AIX, HP-UX, Sun Solaris, DEC Open VMS/Ultrix, SCO Unix/ODT, USL Unix SVR4, Unix Ware LAN/WAN B) Connectivity/ Networking Protocols: TCP/IP, IPX/SPX, NFS, Bridges, Router Gateways, X.25, X.400, ISDN, ATM; C) System/Network Prgrm'g: Perl, Korn, Shell, C Shell, RCP, TLI, Streams, SOCKETS, API & toolkits, DDK, AWK, SED, LEX, YACC; D)Networking techs: Ethernet, Token Ring, FDDI; high mobility preferred (multiple positions) 40hrs/wk; $56,615 - $75,000/yr. Report/submit resume to Tom Dembosky, Manager, Indiena Job Ctr., 350 N. Fourth St., Indiane, PA 15701. JO #5023150.

Senior Systems Engineer: Design, develop & implement customized business software solutions using client/server technologies & internet based Document Management Systems (DMS). Gather client specifications, analyze business requirements & advise clients on a variety of software solutions to meet their business needs. Perform systems & requirements analysis for the design & implementation of iManage. Develop softwere to convert existing DMS such as Soft Solutions & PC DOCS Open to iManage. Develop integration methodologies for iManage with third party e-mail, imaging & faxing systems such as MS-Exchange, Lotus Notes, RightFax & Watermark. Provide technical expertise & input for performance optimization, advanced troubleshooting & tuning of NTSOL Server, Sybase & Oracle on Windows NT, NetWare & Unix. Manage client expectations & vendor relationships & serve as client liaison throughout pre-sale & post-sale relationship. Supervise technical support staff & systems engineers in system development, installation, technical support & training. Must have a Master's degree in Computer Science or Computer & Systems Engineering. Must have et least three yeers of experience in the job offered. 40 hrs/wk, 9:00am - 5:00pm. Overtime required as needed. $70,000/yr. Overtime pay exempt. Must have proof of legal authority to work permanently in the U.S. Send resumes to the ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, Illinois 60605. Attention. Arlene Thrower, Reference # V-IL 20689-T AN EMPLOYER PAID AD. NO CALLS - SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

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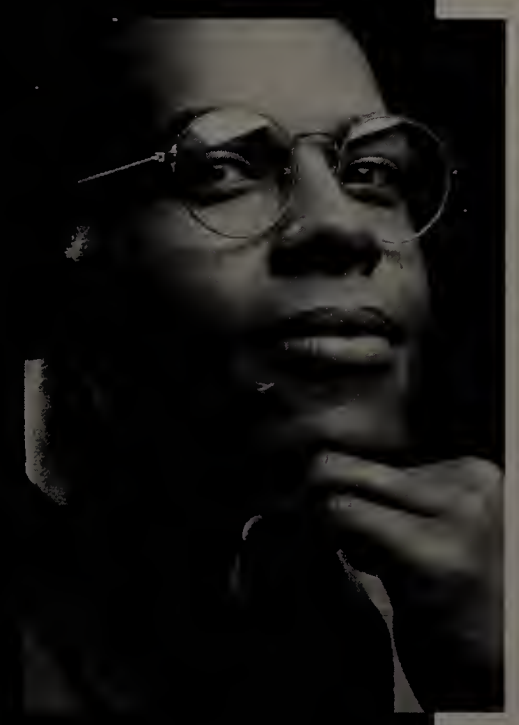

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Summit Group, a subsidiary of CIBER, Inc., is a leading full service provider of systems integration and computer consulting services for medium to large companies. By serving as both an advisor and technician, Summit Group helps its customers succeed by integrating advanced software solutions for more efficient business processes. We provide these services within a framework of integrity and ethical behavior that is beyond reproach. We earn the respect of our competitors and customers by consistently displaying high levels of competency and honesty. These standards allow us to be the best at what we do! Currently, Summit Group has openings for:

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- CPA or CPIM/CIRM accreditation is a plus
- Team lead skills preferred
- Experience on AS/400, UNIX, or Windows NT
- Experience with programming, design and systems analysis
- Solid RPG, Cobol, C, C++ skills
- Experience in a technical lead position
- Desire to travel

A Bachelor's degree and a minimum of 1 year working with JDEdwards and other ERP packages is required. Opportunities exist in: **Parsippany, NJ; Costa Mesa, CA; Dallas, TX; Indianapolis, IN; South Bend, IN; Cincinnati, OH; Denver, CO.**

At Summit Group, we hire professionals and treat them as professionals. If you are interested in exploring career opportunities, forward your resume to **B. Moore, Summit Group, Inc., 4215 Edison Lakes Parkway, Mishawaka, IN 46545, Fax: 219/272-8300 or e-mail: Moore.Brooke@summitgroup.com**

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Hardware/Firmware Engineers: Conduct research & development of nexf generation of high-performance parfs for computer systems Exp. and/or background in the following areas (not all req.): analog/digital circuit design and simulafion (such as layout & timing of CMOS circuifs hardware Synthesis FPGA and ASIC & custom design implementations, and board design ufilizing tools such as ViewLogic), C/C++ programming PC interface signal processing statistics and electronic instrumentation, Req: MS in EE/Comp Eng + 1 2 or 3 yrs exp (or equivalent) depend on position or B.S. + 3-5 yrs exp depend on position in Austin, TX, San Jose CA, Hawthorne or Yorktown Heights, NY, Endicott, NY. Competitive salary. Please send resume w/clipping of ad to: IBM Corporation Technical Recruiting, Job Code CW114, P.O. Box 218, Yorktown Heights, NY 10598. An equal opportunity employer.

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Software Engineers to design, develop, implement, and maintain complex engineering, business, accounting and management infomation applications and systems. Act as lead analyst in the development, implementation and maintenance of computer systems, including networked and client-seerver applications, requiring knowledge and experience across a variety of computing platforms, dafa bases and computer languages. Coordinate and instruct programmers and analysts assigned to his projects. Prepare feasibility studies of potential systems, configuration of components, interactive applications, and complex application specifications. Bachelor's in Computer Science or Engineering plus five yr. exp. in job offered or five yr exp as Pogrammer/Analyst or Systems Analyst, or Master's in Computer Science or Elec. Engineering - with the ability to perform the essential job duties, req. Salary: $58,000/yr. Job site: various unanticipated sites throughout the U.S. Employer location-Pittsburgh. Send your resume to Job #9092603, Pittsburgh South Job Center, 2100 Wharton Street, Pittsburgh, PA 15203

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Programmer/Analyst to plan, develop, test, and document computer programs, applying knowledge of programming techniques and computer systems, including those for both PCs and mainframes. Evaluates user requests for new or modified programs to determine feasibility and cost and time required, compatibilify with current systems and computer capabilities. Formulates plan outlining steps required fo develop program; converts project specs into sequence of detailed instructions and logical steps for coding into language processable by computer, applying knowledge of computer programming techniques and computer languages. Analyzes, reviews and alters programs to increase operating efficiency or adapt to new requirements. Bachelor's in Computer Sc. or Elec. Engineering plus 2 yr- exp. in job offered or 2 yr. exp. as systems analyst or software engineer req. Salary: $55,230/yr. Job site: various unanticipated sites fhroughout the U.S. Employer location: Pittsburgh. Send this ad and your resume to Job #5023152, Tom Rusnack, Charleroi Job Center, 10 Paluso, Dr., P.O. Box 210, Charleroi, PA 15022

Programmer/Analyst. Plan, develop, test and document software applications networking and time tracking systems. Evaluate user requirement and existing software programming codes; determine program intent, data input and output requirements. Modify software application programs in accordance with client needs. Determine feasibility, cost efficiency, time required to complete each stage of the project. Plan development process including flow charts, system specifications and outline steps. Prepare written documentation for new or modified software applications. Idenfify and resolve system operating problems in order to continuously improve the users business operations. Rqrmnfs: Bachelor's degree in Computer Science. 40 hrs/wk, 9:00 a.m. - 5:00 p.m. $57,449.60/year. Must have proof of legal authority to work permanently in the U.S. Crestwood, IL. Send 2 copies of both resume and cover letter to Illinois Dept. of Employment Security, 401 S. State St. - 7 North, Chicago, IL 60605, Attn: Arlene Thrower, Ref. # V-IL 19383-T. An employer paid ad, no calls.

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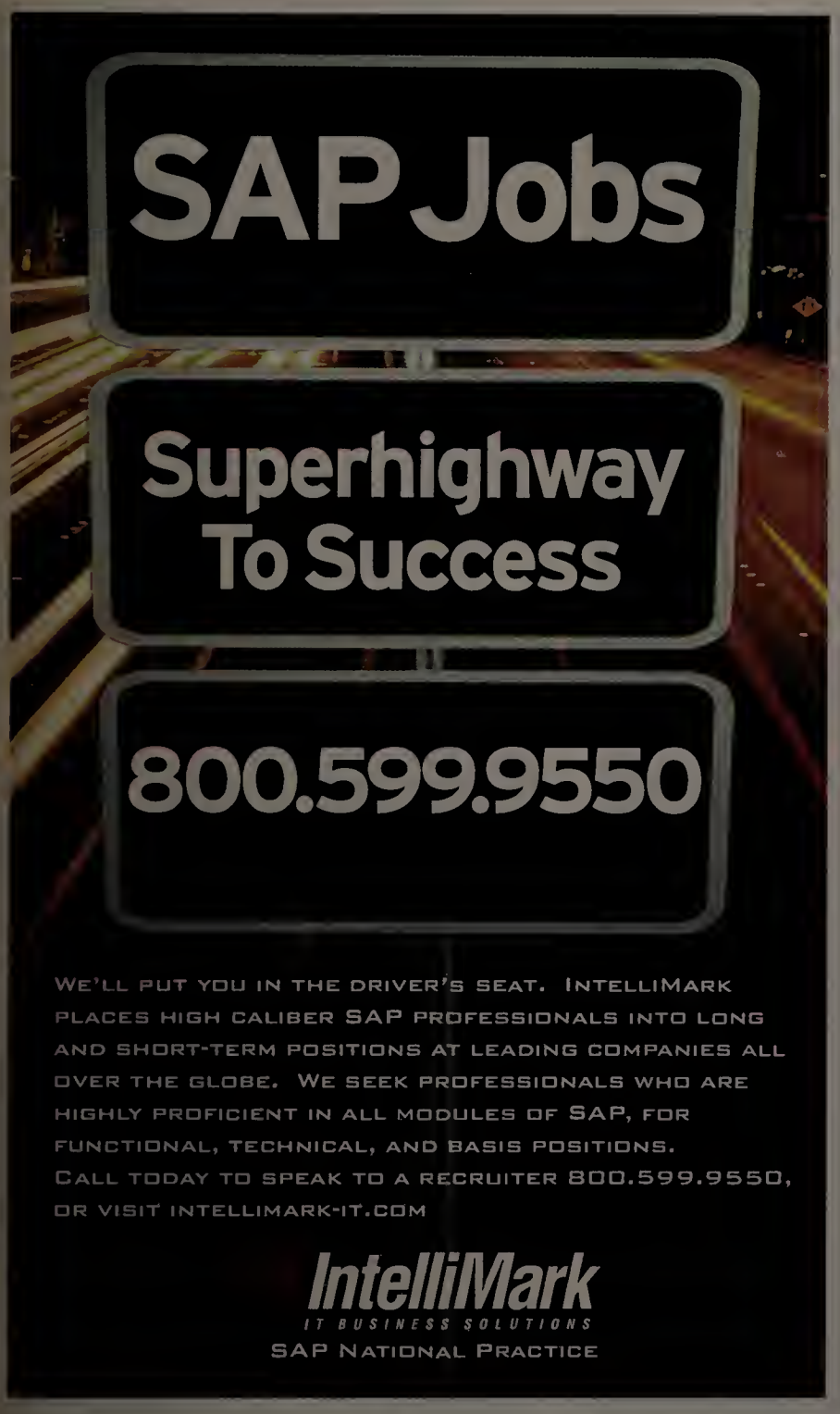

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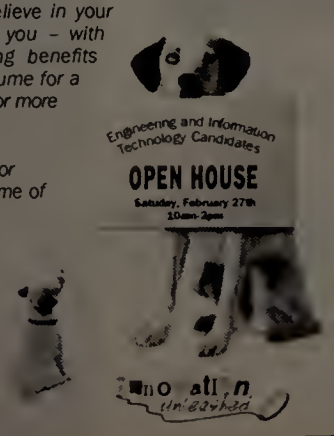

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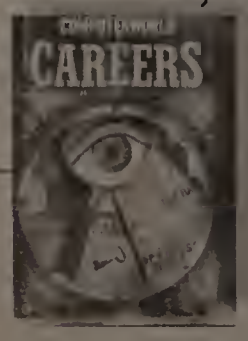

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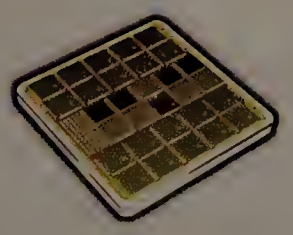

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Proposals must be made in the format specified in the CIMS RFP.

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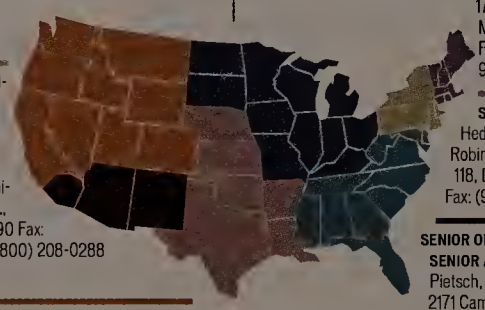

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GAINERS

PERCENT	
Sterling Software Inc.	9.7
Auspex Systems	8.8
Antec	8.5
Comcast (H)	7.9
Checkfree	7.5
Madge Networks	7.3
Ascend Communications Inc.	7.2
Newbridge Networks	7.1

DOLLAR	
Lucent Technologies	6.44
Ascend Communications Inc.	5.19
Comcast (H)	5.19
Uniphase	4.69
Lexmark International Group Nc.	4.25
Worldcom Inc. (H)	3.25
Ameritech Corp.	3.13
Cox Communications Inc.	3.00

LOSERS

PERCENT	
Computer Horizons Corp. (L)	-24.6
Call-Net Enterprises	-14.1
E-Trade Group Inc.	-12.8
Tech Data	-12.4
The Vantive Corp.	-11.7
Yahoo Inc.	-11.6
Dell Computer Corp.	-11.2
Lycos Inc.	-11.0

DOLLAR	
Yahoo Inc.	-17.63
Microsoft Corp.	-11.25
Lycos Inc.	-11.06
Dell Computer Corp.	-10.31
Citrix Systems Inc.	-8.13
Hewlett-Packard Co.	-7.69
Amazon.com	-7.00
Compuware Corp.	-6.75

NASD CONSIDERS TRADING HALTS

Volatile market swings prompt call for controls

INDUSTRY ALMANAC

UNSETTLING CONFUSION caused by wild price swings and earthshaking volumes is becoming a problem for Nasdaq Stock Market Inc., but investment experts are bearish about a proposal to halt trading that seems out of control.

The Washington-based National Association of Securities Dealers Inc. (NASD), which runs Nasdaq, is considering increasing its authority to halt trading immediately when significant news about a company comes up or when a stock is trading with extraordinary volatility. The idea would first be tried for a year and then re-evaluated. NASD may decide by next month whether to embark on a pilot test.

NASD already has taken other measures to limit volatility, such as stepping up monitoring of day trading and extending the time in which stock prices are discovered for initial public offerings.

All of the steps are designed to prevent investors from suffering losses or trading delays that have occurred when a stock's price swings so fast a broker or investor can't determine the actual price and execute the trade accurately.

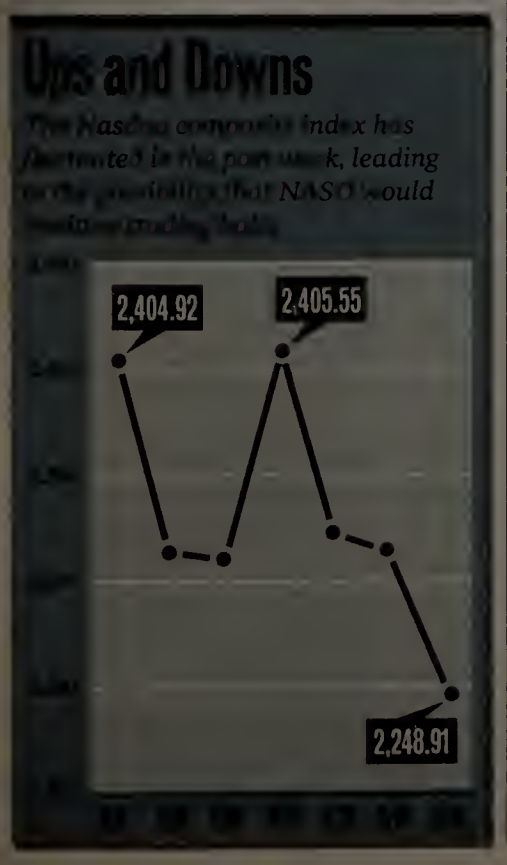
But that hasn't prevented 100-point shifts in the Nasdaq composite (see chart).

Although trading halts are designed to prevent confusion by letting investors think about a stock before trading on it, experts said investors rarely change their behavior after a delay.

"It doesn't do the least bit of good," said Vernon Smith, an economics professor at the University of Arizona in Tucson. Smith simulates stock markets and studies the effect of measures such as trading halts on investor behavior. In some cases, halts have simply dragged the volatility out for a longer period of time, he said.

Trading halts might be useful if they occurred only for a short period of time to let the market's information systems catch up to the trading activity, said Ed LaVarnway, director of the investment strategy group at First Albany Cos. in Albany, N.Y. But the market should never shut down in a paternalistic attempt to cool investor behavior, he said. "Free markets should reign."

— David Orenstein



EXCH	52-WEEK		RANGE	FEB. 19 2 PM	WK NET CHANGE	WK PCT CHANGE
SOFTWARE OFF -3.0%						
ADBE	51.87	23.62	Adobe Systems Inc	42.31	-1.69	-3.8
AZPN	56.87	8.12	Aspen Technology Inc	14.00	-0.63	-4.3
AOSK	50.06	21.62	Autodesk Inc.	40.81	-1.06	-2.5
AVID	47.75	11.06	Avid Technology	30.75	0.88	2.9
BOOL	34.87	16.00	Boole & Babbage Inc	29.25	-1.38	-4.5
CDN	39.00	19.12	Cadence Design Systems	26.75	-3.00	-10.1
CBTSY	63.87	6.68	CBT Group Plc.	16.38	-0.88	-5.1
CHKPF	56.00	10.87	Checkpoint Software Tech. Ltd.	37.69	-4.41	-10.5
CTXS	107.50	36.37	Crtrix Systems Inc.	74.38	-8.13	-9.8
COGNF	30.50	14.75	Cognos Inc.	21.56	-1.63	-7.0
CA	61.93	26.00	Computer Associates Int'l Inc.	42.25	-1.81	-4.1
CPWR	79.81	35.87	Compuware Corp	57.81	-6.75	-10.5
DCTM	59.62	16.75	Documentum	21.00	-1.00	-4.5
EFII	41.00	13.50	Electronics For Imaging	35.50	1.25	3.6
HNCS	47.12	22.50	Hnc Software	26.00	-1.94	-6.9
IDXC	55.75	31.50	IDX Systems	34.28	-0.34	-1.0
IFMX	14.00	3.50	Informix Software Inc	9.53	0.38	4.1
INTU	104.75	34.18	Intuit	78.31	-5.31	-6.4
JKHY	55.00	29.00	Jack Henry Aso	35.75	-3.13	-8.0
LGTO	67.75	22.00	Legato Systems Inc.	42.63	-4.88	-10.3
MACR	42.50	10.12	Macromedia Inc.	30.44	-0.69	-2.2
MANU	66.37	6.12	Manugistics Group Inc.	7.56	-0.50	6.2
MENT	14.50	5.43	Mentor Graphics	13.63	0.63	4.8
MSFT	175.93	76.43	Microsoft Corp	147.88	-11.25	-7.1
NETA	67.68	25.50	Network Associates	42.63	-2.13	-4.7
GMH	57.87	30.37	Network General	47.38	0.06	0.1
NOVL	20.75	8.03	Novell Inc.	18.13	-0.81	-4.3
ORCL	61.75	18.18	Oracle Corp.	53.19	-4.06	-7.1
PMTC	36.31	8.50	Parametric Technology Corp.	14.19	0.06	0.4
PSFT	57.43	16.50	Peoplesoft Inc.	17.88	-0.44	-2.4
PIXR	66.00	27.50	Pixar	41.88	0.00	0.0
PLAT	34.31	9.00	Platinum Technology Inc.	13.75	0.00	0.0
RATL	35.62	10.50	Rational Software Corp	31.75	-2.13	-6.3
SAP	60.12	29.00	SAP AG	29.50	-0.25	-0.8
SCUR	29.00	6.37	Secure Computing Corp.	20.00	0.81	4.2
SE	50.25	20.12	Sterling Commerce Inc.	30.63	-3.13	-9.3
SSW	32.81	20.12	Sterling Software Inc.	25.56	2.25	9.7
SORC	29.00	7.50	Structural Dynamics Research	18.25	0.13	0.7
SYBS	11.62	4.50	Sybase Inc.	8.25	-0.44	-5.0
SYMC	32.62	8.68	Symantec Corp.	19.47	0.72	3.8
SNPS	61.25	24.50	Synopsis	48.88	-2.25	-4.4
SCTC	30.87	8.50	Systems & Computer Technology	9.00	-0.25	-2.7
BAANF	55.50	8.75	The Baan Co. N.V	9.44	0.31	3.4
VNTV	39.75	5.00	The Vantive Corp.	10.38	-1.38	-11.7
TSAI	51.00	27.06	Trans. Sys. Arch.	39.56	-0.38	-0.9
VRTS	86.00	23.75	Veritas Software Corp	71.69	1.56	2.2
WIND	34.43	17.50	Wind River Systems Inc.	22.50	0.63	2.9
TELECOMMUNICATIONS CARRIERS UP 0.5%						
ATI	98.87	42.00	Airtouch Communications	91.75	1.56	1.7
AT	66.50	38.25	Alltel Corp	59.69	-0.63	-1.0
AIT	69.37	40.50	Ameritech Corp.	64.25	3.13	5.1
ANDW	28.87	10.37	Andrew Corp.	16.00	-0.56	-3.4
T	96.12	48.37	AT&T	86.38	0.69	0.8
BCE	46.62	25.62	BCE Inc.	41.56	-0.69	-1.6
BEL	61.18	40.43	Bell Atlantic	58.38	0.56	1.0
BLS	50.00	28.62	Bell South	45.00	0.38	0.8
CSN	21.43	8.50	Cincinnatr Bell Inc.	20.13	0.00	0.0
CMCSK	72.12	31.93	Comcast (H)	70.50	5.19	7.9
CO	42.75	21.75	Comsat Corp.	29.19	0.38	1.3
COX	76.43	37.50	Cox Communications Inc.	69.19	3.00	4.5
GSTRF	37.12	8.31	Globalstar Telecom. Ltd.	16.25	-1.06	-6.1
GTE	71.81	46.56	GTE Corp.	65.44	0.44	0.7
NXTL	34.12	15.37	Nextel Communications	30.88	-0.69	-2.2
SPOT	66.12	26.50	Panamsat	36.13	-0.56	-1.5
QCOM	69.93	37.75	Qualcomm	64.25	-2.75	-4.1
SBC	59.93	35.00	SBC Communications	51.69	0.56	1.1
FON	85.31	51.31	Sprint Corp.	82.81	2.94	3.7
TCDMA	72.18	28.50	Tele-Communications	66.19	1.19	1.8
TOS	54.25	30.62	Telephone And Data Systems	50.25	-0.50	-1.0
USW	66.00	46.81	US West	60.38	0.44	0.7
VIA	84.62	43.50	Viacom	84.25	2.75	3.4
WCII	48.12	10.25	Winstar Communications Inc.	34.44	-1.94	-5.3
WCOM	83.94	37.00	Worldcom Inc (H)	83.94	3.25	4.0
SERVICES OFF -2.3%						
ACXM	31.25	16.50	Acxrom Corp	23.50	-0.19	-0.8
ACS	51.75	22.37	Affiliated Computer Servs	47.50	0.13	0.3
AMSY	40.25	19.25	American Mgt. Systems	32.75	0.84	2.6
AUD	42.62	29.81	Automatic Data Processing	40.81	-0.13	-0.3
BSYS	56.50	34.06	Bisys Group Inc.	52.50	-0.50	-0.9
CATP	58.37	13.37	Cambridge Technology Ptnrs	29.50	-1.50	-4.8
CEN	81.00	45.12	Ceridian	73.81	-0.13	-0.2
CBR	40.87	13.31	Ciber Inc.	24.69	-1.44	-5.5
COD	23.25	10.75	Comdisco	11.56	-0.06	-0.5
CHRZ	53.50	12.50	Computer Horizons Corp. (L)	12.81	-4.19	-24.6
CSC	74.87	46.25	Computer Sciences	68.00	-3.31	-4.6
OST	70.56	34.00	Ost Systems Inc	55.13	0.19	0.3
EOS	54.00	30.43	Electronic Data Systems	45.50	-1.88	-4.0
FDC	39.25	19.68	First Data Group	36.38	0.06	0.2
FISV	54.43	35.18	Fiserv	48.83	0.34	0.7
IT	41.75	17.31	Gartner Group	21.63	-1.00	-4.4
KEA	60.93	24.75	Keane	30.25	-2.56	-7.8
NDC	55.25	26.18	National Data	51.00	-0.13	-0.2
PAYX	55.06	32.43	Paychex Inc	41.63	-3.38	-7.5
REGI	30.50	5.12	Renaissance Worldwide	6.56	-0.56	-7.9
REY	24.00	12.82	Reynolds & Reynolds	20.19	0.31	1.6
SFE	47.25	17.12	Safegard Scientrics	39.75	-1.31	-3.2
SAPE	82.87	24.25	Sapient Corp.	70.13	2.50	3.7
SMS	86.50	40.06	Shared Medical Systems	54.19	0.44	0.8
SOS	41.87	21.68	Sungard Data Systems (H)	39.44	2.00	5.3
SYNT	32.62	8.68	Syntel Inc.	19.47	0.72	3.8
TECO	53.12	19.75	Tech Data	20.38	-2.88	-12.4
TSS	26.25	14.43	Total System Services Inc	24.69	0.94	3.9
TSAI	51.00	27.06	Transaction Sys. Architects	39.56	-0.38	0.9
NETWORK OFF -1.1%						
COMS	51.12	22.93	3Com Corp	33.44	1.31	4.1
ADCT	44.06	15.75	ADC Telecommunicat ons Inc	39.94	-0.25	0.6
ANTC	26.75	11.00	Antec	26.31	2.06	8.5
ASND	93.37	31.08	Ascend Commun cations Inc	77.00	5.19	7.2
BNYN	19.37	2.12	Banyan Systems Inc	10.19	-0.88	7.9
CS	16.43	6.62	Cabletron Systems	8.00	-0.56	8.6
CNEBF	20.00	5.75	Call-Net Enterprises	6.88	-1.13	-14.1
CSCO	117.50	40.12	Cisco Systems Inc	96.94	-3.19	3.2
ECILF	45.00	19.75	ECI Telecom	33.94	-0.19	-0.5
FORE	28.00	9.25	Fore Systems Inc	18.00	-0.13	-0.8
HRS	55.31	27.56	Harris Corp	34.83	-0.44	-1.2
GMH	57.87	30.37	Hughes Electron cs/GM	47.38	0.06	0.1
ERICY	34.00	15.00	LM Ericsson	26.56	0.56	2.2
LU	120.00	46.37	Lucent Technologies	103.13	6.44	6.7
MADGF	7.75	1.75	Madge Networks	3.69	0.25	7.3
NCOI	13.75	4.37	Network Computing Dev	5.75	-0.13	-2.1
NWK	20.62	8.00	Network Equipment Tech	8.56	-0.06	-0.7
NN	39.87	15.43	Newbridge Networks	26.50	1.75	7.1
NOK A	155.37	46.68	Nokia Corp	130.86	-3.88	-2.9
EXCH	52-WEEK		RANGE	FEB. 19 2 PM	WK NET CHANGE	WK PCT CHANGE
NT	69.25	26.81	Northern Telecom Ltd	60.06	1.31	2.2
PAIR	24.37	6.00	Pairgain Technologies Inc	9.00	-0.88	-8.9
PCTL	11.93	4.75	Picturetel	8.69	-0.31	-3.5
SFA	33.50	11.75	Scientific Atlanta	29.50	-3.13	-9.6
SHVA	14.37	2.75	Shiva	5.88	0.00	0.0
TLAB	93.12	31.37	Tellabs Inc	76.19	-1.81	-2.3
USW	66.00	46.81	US West	60.38	0.44	0.7
VRLK	11.18	2.87	Verrink	3.41	-0.16	-4.4
WSTL	14.75	2.75	Westell Technology Inc	4.75	-0.50	-9.5
XYLN	31.31	9.62	Xylan	20.13	0.25	1.3
SEMICONDUCTORS, CHIPS & EQUIPMENT UP 0.3%						
AOPT	27.50	7.87	Adaptec	22.63	1.06	4.9
AMD	33.00	9.31	Advanced Micro Devices	17.31	-0.19	-1.1
ALTR	71.87	28.25	Altera	58.63	1.13	2.0
ADI	39.62	12.00	Analog Devices	29.25	-1.13	-3.7
AMAT	71.62	21.56	Applied Materials (H)	67.13	1.50	2.3
ASML	49.06	12.93	ASM Lithography Holding	43.50	-1.38	-3.1
HRS	55.31	27.56	Harris Corp	34.63	-0.44	-1.2
INTC	143.68	65.65	Intel Corp	129.88	2.94	2.3
KLAC	63.75	20.75	Kla Instruments (H)	59.50	0.88	1.5
LLTC	104.75	39.12	Linear Technology	98.63	3.25	3.2
LSI	29.37	10.50	LSI Logic	27.94	1.31	4.9
MXIM	56.62	22.31	Maxim Integrated Products	45.50	1.06	2.3
MU	80.56	20.06	Micron Technology	64.75	-0.50	-0.8
MOT	73.50	38.37	Motorola	67.56	1.38	2.1
NSM	24.93	7.43	National Semiconductor	11.19	-0.19	-1.6
STM	107.62	35.87	Sgs-Thomson Microelectronics	92.38	-2.25	-2.4
SLR	93.50	35.43	Solectron Corp.	87.38	2.08	2.4
TER	66.50	15.00	Teradyne	58.31	1.63	2.9
TXN	102.81	45.37	Texas Instrumments	94.50	1.50	1.6
UNPH	93.75	31.25	Uniphase	86.81	4.69	5.7
VTSS	52.93	17.12	Vitesse Semiconductor Corp	44.13	-0.88	-1.9
XLNX	87.62	29.75	Xilinx	75.00	-3.50	-4.5
COMPUTER SYSTEMS OFF -3.3%						
AAPL	47.31	19.56	Apple Computer Inc	37.06	-0.75	-2.0
ASPX	10.25	1.62	Auspex Systems	9.25	0.75	8.8
CPQ	51.25	22.93	Compaq	41.63	-1.58	-3.6
DGN	21.81	7.00	Data General	15.44	-1.13	-8.8
DELL	110.00	27.68	Dell Computer Corp	81.56	-10.31	-11.2
GTW	80.43	36.12	Gateway 2000 Inc.	71.31	0.13	0.2
HWP	83.87	47.06	Hewlett-Packard Co	68.75	7.69	-10.1
HIT	79.43	40.18	Hitachi Ltd.	60.81	-3.94	-6.1
IBM	199.25	95.87	IBM	173.38	1.00	0.6
MUEI	24.75	9.68	Micron	14.06	0.31	2.3
MOT	73.50	38.37	Motorola	67.56	1.38	2.1
NATI	36.50	17.50	National Instruments Corp	29.19	-0.19	0.6
NCR	55.75	23.50	NCR	44.13	1.00	2.3
NIPNY	58.37	31.00	NEC	44.25	-2.88	-6.1
PRCM	13.25	3.50	Procom Tech Inc	6.19	-0.75	-10.8
SQNT	22.62	5.68	Sequent Computer Systems	9.44	-0.69	-6.8
SGI	20.87	7.37	Silicon Grafix	16.75	-0.31	-1.8
SNE	97.00	60.25	Sony	75.63	2.75	3.8
SUNW	115.75	37.62	Sun Microsystems	96.83	-3.83	-3.6
TEXM	5.93	2.00	Texas Micro	4.56	-0.58	-11.0
TRCO	4.87	0.37	Tricord Systems	2.94	-0.31	-9.6
UIS	36.37	16.75	Unisys	31.38	-0.75	2.3
INTERNET OFF -4.2%						
AMZN	199.12	10.12	Amazon.com	98.25	7.00	6.7
AOL	177.50	27.75	America Online	159.38	0.00	0.0
ATHM	131.00	23.50	Athome Corp	100.88	-0.50	0.5
CKFR	42.00	5.75	Checkfree	33.06	2.31	7.5
CYCH	27.75	5.87	Cybercas, Inc	12.81	-1.31	9.3
EDFY	20.87	4.62	Edify Corp.	6.13	-0.59	8.8
EGRP	66.43	5.00	E-Trade Group Inc	40.69	-5.88	12.6
XCIT	125.00	18.00	Excite Inc.	94.00	1.38	1.4
SEEK	100.00	13.50	Infoseek	61.00	2.69	-4.2
LCOS	145.37	17.82	Lycos Inc	89.50	-11.06	11.0
NSCP	74.87	15.50	Netscape Communications	70.00	1.78	2.8
OMKT	29.12	4.25	Open Market Inc	12.88	0.94	-6.8
OTEX	31.75	10.00	Open Text Corp	22.00	1.13	5.4
PSIX	40.18	7.31	Psinet	33.38	1.63	4.6
QDEK	3.00	0.25	Quarterdeck Corp	0.50	0.00	0.8
SDTI	42.75	5.43	Security Dynamics	16.50	0.75	-4.3
SPYG	32.25	7.00	Spyglass Inc	11.00	0.94	7.9
YHOO	222.50	15.25	Yahoo! Inc	134.50	17.63	11.8
STORAGE & PERIPHERALS OFF -1.1%						
AOPT	27.50	7.87	Adaptec Inc.	22.63	1.06	4.9
APCC	55.50	25.00	American Power Conversion	39.00	0.13	0.3
CANNY	24.56	17.00	Canon Inc.	21.89	0.38	1.8
OBD	55.31	19.12	Diebold Inc.	29.88	-0.75	2.4
EK	88.93	60.00	Eastman Kodak Co	68.31	1.25	1.9
EMC	109.87	34.25	EMC	102.00	1.[illegible]	[illegible]
IOM	10.18	2.93	Iomega	6.38	0.06	[illegible]
LXK	114.18	41.88	Lexmark Int l Group Nc	104.94	4.25	4.2
QNTM	29.93	10.81	Quantum	21.44	0.63	3.0
SEG	44.25	16.12	Seagate Technology	31.75	2.94	8.5
STK	51.12	20.12	Storage Technology	36.75	1.06	2.8
TEK	48.18	13.68	Tektronix	21.31	1.88	8
XRX	126.00	76.00	Xerox	116.[illegible]	2.88	[illegible]

KEY: **(H)** = New annual high reached in period
(L) = New annual low reached in period

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Beta 3 Fixes Tackle 9x Migration

differently."

Beilinson said he isn't yet sure how Microsoft will solve that problem, but he hopes to have the solution in place before the final software release.

Microsoft doesn't yet have anything to help end users prepare for the coming of Windows 2000 to their desktop. "It's a pretty hefty upgrade, so we'll need something — probably a variety of tools," said a spokesman.

He said training courses and CD-ROMs are being considered, but no final decisions have been made.

The issue is the same for Windows 3.x, 95 and 98 users migrating to NT 4.0. "You just had to wipe and load," said a Microsoft spokeswoman.

Migrating to either version of NT may be so difficult that it isn't worth it.

Users would be better off scrapping what they have and starting over, said Rob Enderle, an analyst at Giga Information Group Inc. in Cambridge, Mass. "The operating systems are too different," Enderle said. "While you could do it, it's not recommended."

Bill Peterson, an analyst at Framingham, Mass.-based International Data Corp., said software is only part of the picture. He pointed out that many companies will have to upgrade their hardware or at least add more memory.

He said the minimum memory requirement to run Windows 98 is 16M bytes, but the minimum requirement for Windows 2000 Professional is 32M bytes — and that's before the user starts adding lots of heavy applications on top of it.

"People with older systems, like Windows 95, probably are looking at a box swap," said Dan Kusnetzky, an analyst at IDC. He said people running Windows 98 probably have enough memory and processing power to run Windows 2000 because they have similar requirements.

Kusnetzky said Win 95 desktops will need more memory and more processing power and it's . . . easier to bring in a new PC than . . . tinker with the old one. "It could be $2,000 to $3,000 just to replace the hardware for a fairly heavily loaded system," he said. "And when you figure in the staff time it takes to move the old applications and data off the old system and onto the new, you're looking at $4,000 to $5,000."

That means the average company will be looking at upgrading hardware, buying new, compatible applications or doing rewrites on old applications, allocating information technology workers to possibly touch every desktop in the company and training the IT department.

Analysts estimate the installation probably will take two to four hours per desktop. And for a company migrating 10,000 desktops and spending an average of three hours per desktop, that rings up to 750 workweeks on that process alone.

On the plus side, Enderle also said a fresh installation will make the platform more stable, something NT has struggled with over the years. "Windows 2000 is potentially much more solid than anything else Microsoft has built, but you won't see the difference unless you start from scratch," he added.

Users may find it hard to look on the bright side.

"If I have to blow away 95 to install NT, that's going to be time-consuming and not something we like to do," said John Scannello, director of information technical planning at Consolidated Edison Company of New York Inc. "And if I have applications that aren't easily installed, that just makes it worse."

"That's going to make me sit back and think, and first I'll think about wringing their necks," said Paul Soares, general manager and financial vice president at Alden Buick Pontiac GMC, a $20 million auto dealership in Fairhaven, Mass. "I've got older Pentiums and even 486s that may not handle this at all. . . . This is going to be a royal pain and take a lot of time — time I don't have."

Ultimately, users will have to move from Windows 95 and 98 to Windows 2000. Microsoft says all its future operating systems, both desktop and server, will be based on NT. ◗

Boosting Beta 3

According to Craig Beilinson, Microsoft product manager for Windows NT, the NT team is working on making the following changes/additions to Beta 3 of Windows 2000:

- Adding more wizards to the setup process.
- Enabling recognition of more hardware and software configurations.
- Adding Sys Prep, a utility that lets a systems administrator push down a cloned drive with Windows 2000, applications and a Web browser already installed.
- Improving the Set Up Manager from Beta 2. The utility can set up desktop installations according to preselected specifications. – *Sharon Gaudin*

MOREONLINE

For resources, articles and news about Windows 2000, visit our Web site.
www.computerworld.com/more

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Alert: Fixed Y2K Code Still Buggy

auditor such as Cap Gemini or Andersen Consulting to review their remediated code for mistakes.

Of course, Cap Gemini has a self-interest in publicizing the error rate. "Don't independent organizations [like Cap Gemini] have something to gain? They'd like to come in and fix everything," said Rick Brown, a Linwood, Mass.-based contract programmer who's working on his fourth year 2000 project for an aerospace firm.

Still, the notion that fixing software produces a new batch of errors is well-known. Companies with hundreds of millions of lines of legacy code "just can't catch it all," said John Stumpf, information systems director at Guinness Import Co. in Stamford, Conn.

Another option is to use independent verification and validation tools to sift through the code thought to be fixed and look for errors. Examples include the Exam 2000 package from Tominy Inc. in Cincinnati and Millennium CrossCheck from Data Integrity Inc. in Waltham, Mass.

The consequences for organizations that don't validate their software conversions "are scary," Stumpf said. "All it takes is one problem, and you're in trouble."

Because of the availability of auditing tools and the general knowledge about errors introduced through software remediation, "it's almost malpractice or negligence" for organizations not to have their work checked, Rubin said. Most of the defects detected by Cap Gemini weren't "catastrophic" and didn't stop processing, Rubin acknowledged, but he said they would have caused glitches after Jan. 1, 2000.

Rubin advised companies to monitor those "nagging errors" that don't disable systems but can have ripple effects, such as fouling up general ledger systems. "My greatest fear is that most everything appears to work, but [below the surface] it doesn't," he said.

Ron O'Donoughue, year 2000 project manager at Royal Bank of Canada in Toronto, is a true believer in verifying year 2000 repairs by using automated tools, which he said are much faster and more accurate than manual methods.

For the 8 million lines of Cobol code the bank manually converted, it missed one to 14 dates per program, O'Donoughue said. But the automated tool the bank used didn't miss one date field in the 22 million lines it scanned.

Independent verification, he said, is "cheap insurance, but it's valuable." ◗

Drugstore Chain Lures Eyes With Web-Only Coupons

BY ROBERTA FUSARO

Add Longs Drug Stores to the list of retailers offering Internet coupons at their Web sites.

Many of Longs' competitors offer health care information and prescription refill services online. But Walnut Creek, Calif.-based Longs is trying to drive business to its 2-year-old Web site by rewarding customers with coupon discounts that aren't available in the Sunday newspapers, said Mike Deimling, director of category management at Longs. That may include 50 cents or $1 off products such as toothpaste, mustard or aspirin.

So the $3 billion, 382-store chain last week said it's using "U-pons," Internet coupons from San Francisco-based marketer Planet U Inc. Customers pick the coupons they want at the Longs Web site, and those are mailed to customers for redemption at brick-and-mortar stores. Longs logs customer preferences in a database.

Analysts praised Longs' step as progressive. Longs has traditionally been a good neighborhood marketer, but the targeted marketing approach could present a competitive advantage for the company, said Meredith Adler, a retail analyst at Lehman Brothers Inc. in New York. ◗

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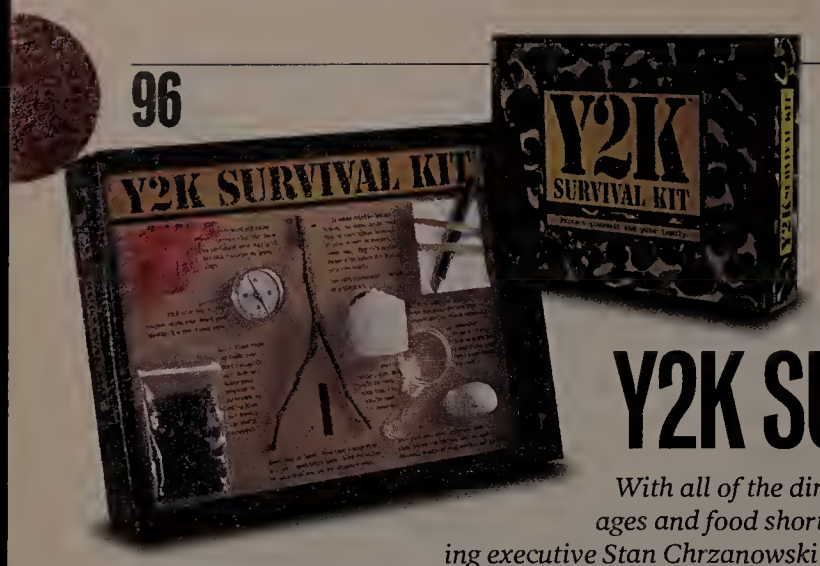


Y2K SURVIVAL KIT

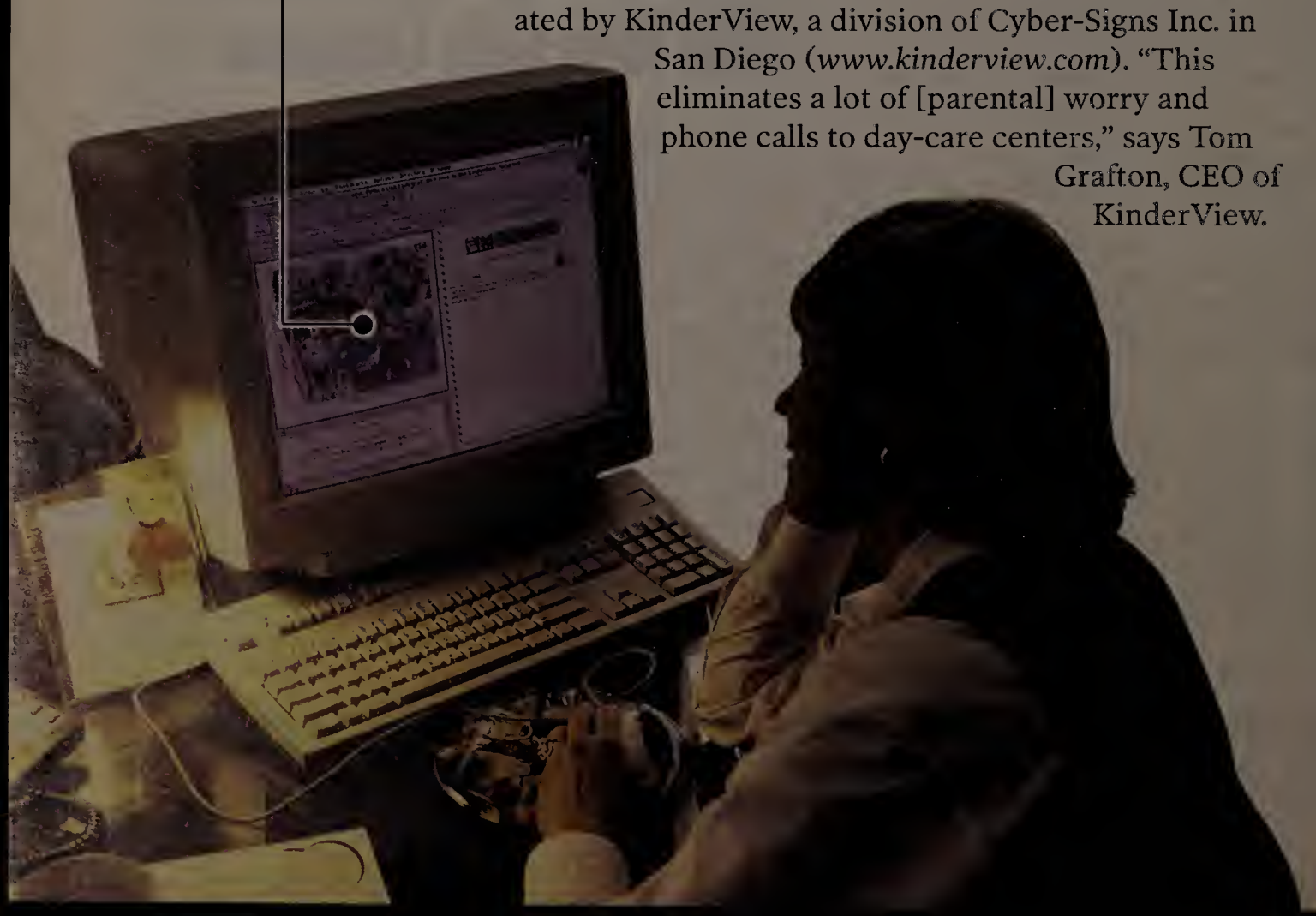
With all of the dire predictions about power outages and food shortages in January 2000, advertising executive Stan Chrzanowski dreamed up the Y2K Survival Kit ($14.95 at http://y2ksurvivalkit.net) as a gag gift. It includes the following:

- A **compass** to help you find your way to the nearest wilderness to start a new human race
- A tiny **squirt gun** to ward off critters who want to confiscate your food stash
- A forked **dowsing stick** to find fresh water supplies (doubles as a slingshot)
- A **magnifying glass** to help start a fire
- A **candle** for use when the lights go out
- A **pencil** and **pad of paper** to use for communicating when the E-mail is gone
- **Plant seeds** for starting your own food supply or for desperate munching

Webcam Keeps an Eye On Day-Care Kids

USING A REGULAR WEB browser and KinderView's virtual private network, parents get a window into their child's classroom. Access requires entering a school code, log-in name and a password, which is changed frequently

IS CAITLIN EATING her lunch? Is Jeremy eating Play-Doh again? From Jellybean Junction in Iselin, N.J., to Precious Child Learning Centers in Amarillo, Texas, and Mother Goose in Oxford, Miss., day-care centers and preschools are hooking up cameras that allow working parents to see their child's classroom using a regular Internet browser. The system is operated by KinderView, a division of Cyber-Signs Inc. in San Diego (*www.kinderview.com*). "This eliminates a lot of [parental] worry and phone calls to day-care centers," says Tom Grafton, CEO of KinderView.



INSIDE LINES

WAITING FOR WIN2K
It may be little solace for potential Windows 2000 users – with beta testers reporting frequent crashes and upgrade problems – but Giga Information Group analyst **Rob Enderle** seems to be amending his prediction for when the Windows NT successor will arrive. After a Microsoft briefing last week, Enderle said he's **"more hopeful than before"** that the new operating system actually might ship by the end of this year. Other, less optimistic, analysts expect Win2K to show up some time in 2000.

SAP ON TAP
Guinness Import IT chief John Stumpf is shifting roles for the Stamford, Conn.-based U.S. distributor of malts and other fine brews. Beginning in March, Stumpf will oversee a rollout of SAP R/3 software across Guinness' North American facilities. The bad news: Guinness has only a handful of permanent IT employees, and delivering SAP will take **two years**. The good news: When it's all over, at least Stumpf and his team won't have far to go for the party.

HONEST WORK FOR A CHANGE
Now here's a creative approach to filling open IT jobs: **Hire a lawyer**. MicroStrategy, a decision-support vendor and consulting firm in Vienna, Va., is actively recruiting lawyers for IT positions. The Washington area has a lot of lawyers – all accustomed to a fast-paced and competitive environment – and they seem to be perfect IT candidates. The company puts the barristers through a six-week **boot camp** to turn them into tech-support consultants or trainers. So far, 15 lawyers are on MicroStrategy's IT payroll.

OVERHEARD
Hal Zesch, SAP coordinator at petroleum refiner Valero Energy, on keeping project teams small: "You can only have one person configuring a [data] table at a time. But consulting firms send five people in, so four of them are just sitting or standing there."

BACK TO THE FUTURE
Maybe the year 2000 problem won't throw us back to the year 1900 – just 1978. Silicon Valley songwriter **"Loose Bruce" Kerr** (who's also a lawyer for Sun) is getting radio airplay for "**Y2K**," a parody of the disco hit "YMCA." Sample lyrics: "Young man, might your server go down? / I said, young man, will your customers frown? / Your business – will it still be around / When it turns 010100?" News editor **Patricia Keefe** hopes you'll boogie her way with news tips and tidbits. E-mail her at **patricia_keefe@computerworld.com** or call (508) 820-8183.

The 5th Wave

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